West Valley Demonstration Project

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Waste Storage Tank 8D-3 Radioisotope Inventory Report

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List of Attachments

1.0 Introduction

This report forecasts a conservatively bounded long-lived curie inventory of the active Waste Storage Tank 8D-3 for use with performance assessment modeling. Evaluation and characterization activities were conducted in accordance with WVDP-403, "Characterization Management Plan for the Facility Characterization Project" (CMP)[1].

The approach used to evaluate Waste Storage Tank 8D-3 and generate the projected inventory estimate involved the following steps:

- Collection and evaluation of current and historical information and data on the tank.
- An assessment of the information available which deemed the existing data to be valid and usable to construct the inventory estimate.
- Calculation of the tank radionuclide inventory from liquid sample results and the forecasted volume of tank liquid.

2.0 Waste Storage Tank 8D-3 Description

Tank 8D-3 is a storage tank in the Waste Tank Farm (WTF) located in an underground concrete vault. The tank measures 12 feet in diameter, 18 feet high, and has a working volume of 11,000 gallons with a maximum capacity of 14,300 gallons. It is constructed of Type 304 L stainless steel with 0.375 inch thick walls and bottom and a 0.313 inch thick top (see Attachment A).

Tank 8D-3 was designated as a spare for high-level waste (HLW) storage Tank 8D-4, but was never used by Nuclear Fuel Services (NFS) during the period of 1966 thru 1980[3]. It was first used in 1988 by the West Valley Demonstration Project (WVDP) as an intermediate storage and sampling tank for the Supernatant Treatment System (STS) during the High-Level Radioactive Waste Pretreatment Program. Decontaminated supernatant and sludge wash water was stored in Tank 8D-3 prior to transfer to the Liquid Waste Treatment System (LWTS) for additional processing. Following completion of the High-Level Radioactive Waste Pretreatment Program, Tank 8D-3 has remained in operation as part of ongoing water management activities in the WTF.

With the exception of the Vitrification Facility Concentrator Feed Makeup Tank (CFMT) distillates, which are routed directly to Tank 8D-3, all STS effluents are filtered to remove any particulates prior to receipt in Tank 8D-3.

Tank 8D-3 has two side-mounted cooling coils and one bottom cooling coil, with a total heat removal capacity of about 175.8 kW. The coils are l.5 inch seamless 304 L stainless steel. The temperature of stored liquids can be controlled manually by adjusting cooling water flow to the cooling coils.

Both Tanks 8D-3 and 8D-4 are co-located in a single reinforced underground concrete vault, measuring 32 x 18 x 27 feet. Its walls and roof are 21 inches and 2 feet thick, respectively, as shown in Figure 1. The vault is lined to a height of 18 inches with l/8-inch 304 L stainless steel which forms a pan equipped with an alarmed sump. The tank is mounted on legs that support the tank 33 inches off the bottom of the vault.

Tank 8D-3 is ventilated by both the Vitrification Process Ventilation System and Permanent Ventilation System (PVS), where it is filtered before being released to the atmosphere.

A vertical transfer pump in Tank 8D-3 pumps the tank contents down to a heel of about 1,800 gallons per the HLW Tank Farm engineering manager.

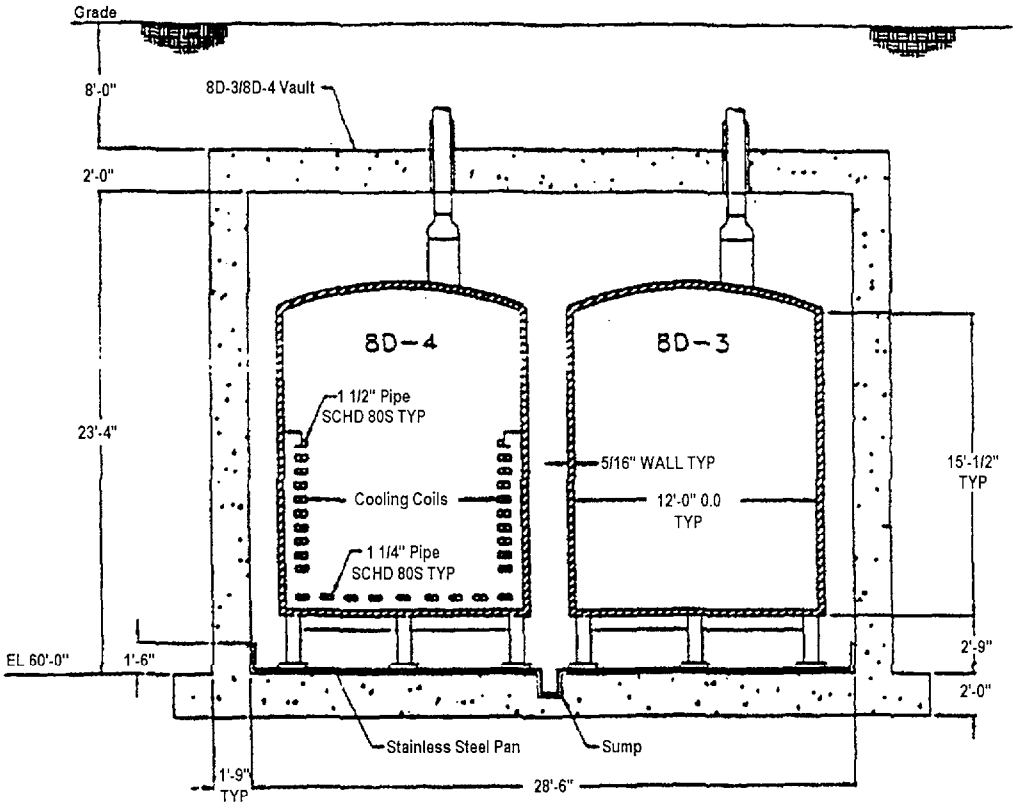


Figure 1 - Tanks 8D-3 and 8D-4

3.0 Historical Record Review

The following reports/records were found to contain background information on Waste Storage Tank 8D-3:

- WVNS Technical Paper, "High-Level Waste Radioactive Waste Pretreatment at the West Valley Demonstration Project," D. C. Meess, Waste Management '96, February 1996.
- WVDP-EIS- 017, "High-Level Waste Storage Area and Vitrification Facility Waste Characterization Report," Revision 1, 1995.
- DOE/EIS-0226-D, "Draft Environmental Impact Statement for Completion of the West Valley Demonstration Project and Closure or Long-Term Management of Facilities at the Western New York Nuclear Service Center," January 1996.

Additional background information and verifiable data (e.g., radioisotopic analytical data) were found in:

- B&W Nuclear Environmental Services, Inc., Report No. 92:10274NL:01, "Data Reporting Package for West Valley Nuclear Services Company," dated December 1992.
- Babcock & Wilcox, Research & Development Division, Report No. 9705052, Revision 1, "Data Reporting Package for West Valley Nuclear Services Company," dated June 24, 1997.
- WVNSCO Internal Memorandum FG:2002:0007, G. M. Rhodes to J. M. Fazio, "Uranium Isotope Comparison Between D. V. Wallon's Reports and Ryyken Topical Report 14," dated July 9, 2002.
- WVNSCO Report, "High-Level Waste Tanks 8D-1 and 8D-2 Radionuclide Inventory Report as of July 31, 2001," dated July 31, 2001.
- WVNSCO Topical Report DOE/NE/44139-83, "Integrated Radwaste Treatment System Final Report," dated October 1997.

3.1 Operating History

The operating history of Waste Storage Tank 8D-3 is graphically shown in Figure 2[15] and is summarized below as extracted from Reference 2.

Tank 8D-3 was never used until May 1988. Between May 1988 to May 1995, Tank 8D-3 operated as a holding tank for decontaminated supernatant and sludge wash solutions that resulted from the pretreatment of the PUREX and THOREX high-level wastes. Without pretreatment of the HLW, the quantity of vitrified waste would have increased over tenfold. Chemical compounds having a detrimental effect on the final vitrified HLW form, such as sodium sulfate, were separated from most of the radioactive elements and solidified into cement via the Integrated Radwaste Treatment System (IRTS).

The IRTS was originally designed to carry out the HLW pretreatment of supernatant and sludge wash solutions utilizing four separate subsystems: the Supernatant Treatment System (STS), Liquid Waste Treatment System (LWTS), Cement Solidification System (CSS), and Drum Cell (DC). The STS used zeolite to separate the highly radioactive constituents in the HLW from the supernatant and sludge wash solutions. Four zeolite-loaded, ion-exchange columns, contained in Tank 8D-1, were used to strip greater than 99.9 percent of the soluble radioactive Cs-137.

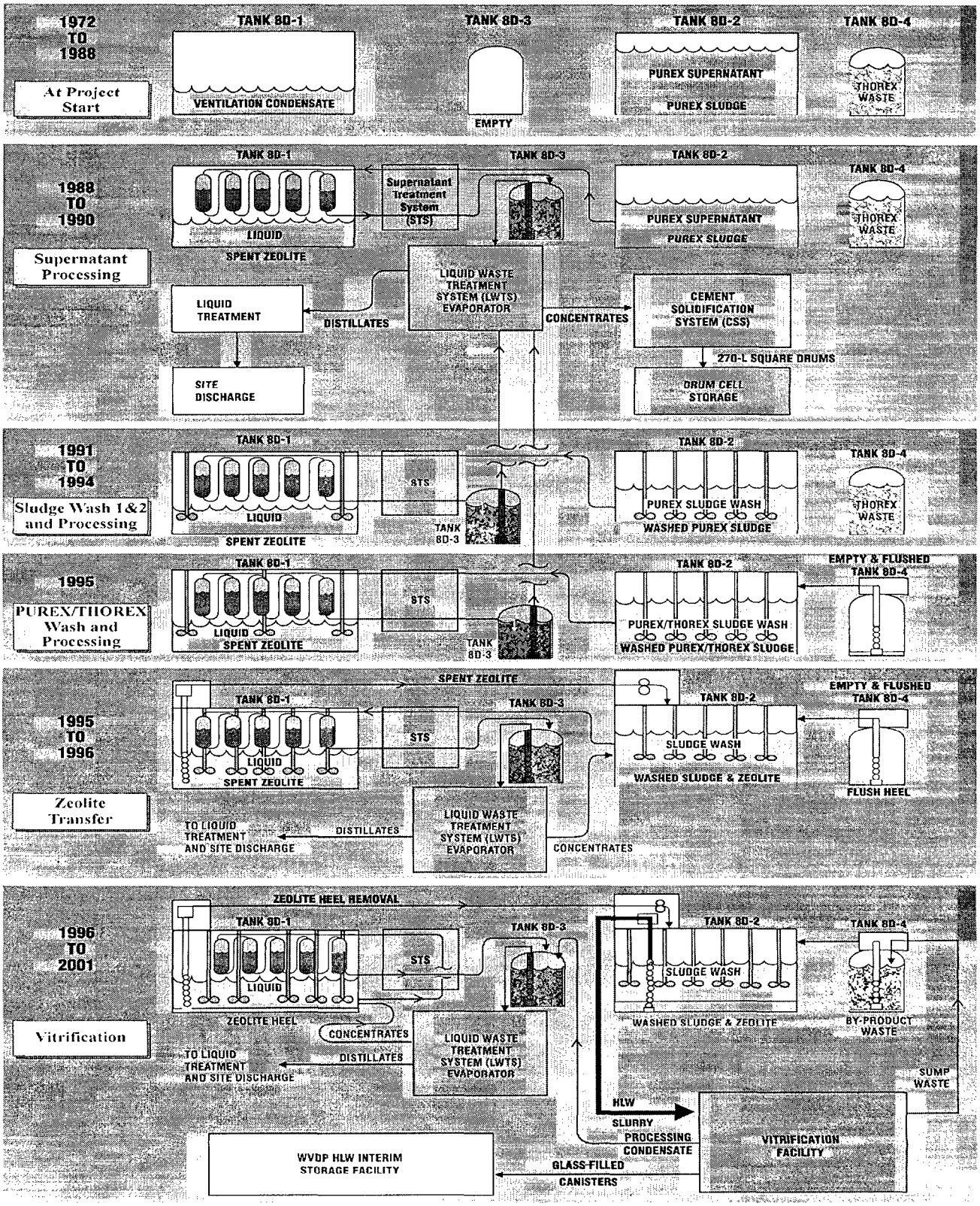


Figure 2 - HLW Pretreatment and Subsequent Vitrification Processing

Decontaminated supernatant and sludge wash solutions from the STS were received in the STS effluent Tank 8D-3 and batch transferred after sampling to the LWTS where they were volume reduced by evaporation to a concentration suitable for solidification with Portland cement. The CSS mixed the decontaminated liquid concentrates with Portland cement and other admixtures and remotely filled 71-gallon square drums with cement waste. These drums were delivered to the remotely operated DC where the drums were placed into storage.

Processing of the PUREX supernatant and liquids from washing the PUREX-based sludge and the additional THOREX waste was completed in 1995, resulting in a total of 5 million gallons of liquid being processed and a total of 19,877 drums of cement-based waste produced and stored on site. Typical radionuclide concentrations for the decontaminated PUREX supernatant and decontaminated sludge wash solutions are shown in Table 1. These samples were obtained following concentration of the decontaminated supernatant and sludge wash solutions in the LWTS evaporator and are therefore more conservative than the decontaminated solutions from the STS received in Tank 8D-3. This data is used to support a characterization methodology for Tank 8D-3 and is not used to calculate the radionuclide inventory.

Subsequent to completion of the High-Level Radioactive Waste Pretreatment Program in 1995, Waste Storage Tank 8D-3 has remained in operation as part of ongoing water management activities.

Tank 8D-3 served as both an intermediate storage tank and sampling tank for the decontaminated sodium-bearing waste water (SBWW) and Vitrification Facility condensates (distillates from boiling the CFMT) before being transferred to the LWTS for additional processing. Processing of the SBWW is projected to continue throughout FY2002 and into FY2003 while receipt of Vitrification Facility condensate will be discontinued in late FY2002 after shutdown of the melter.

Wastes transferred from Tank 8D-2 to the Vitrification Facility for production of HLW glass were mobilized with pumps that were pressurized with clean water to lubricate and cool the drive line column bearings. It is estimated that as a result of waste transfers and the use of water to enhance mobilization pump operation, approximately 1.2 million gallons of clean water were added to the WTF system due to pump column leakage.[8] Excess water in Tank 8D-2 was decanted to Tank 8D-1 to maintain the HLW solids concentration in the feed stream to the Vitrification Facility.

The excess liquid stored in Tank 8D-1 was decontaminated by processing through the STS zeolite columns to reduce the Cs-137 content, collected in Waste Storage Tank 8D-3, and transferred to the LWTS evaporator for volume reduction. Evaporator bottoms were rerouted back to Tank 8D-1. As part of tank corrosion control, sodium hydroxide was added to the carbon steel Tanks 8D-1 and 8D-2. As a result of the neutralization, sodium salts have accumulated in the Tank 8D-1 and 8D-2 liquid. This resultant liquid is the SBWW. Typical radionuclide concentrations for the decontaminated SBWW liquids collected in Tank 8D-3 from STS processing are shown in Table 2.

To a lesser extent, the SBWW was also processed in the CFMT. The SBWW was used as a transfer medium for sludges in Tank 8D-2 and was boiled off in the CFMT, resulting in CFMT distillates being returned to Tank 8D-3. Typical radionuclide concentrations for the SBWW CFMT distillates collected in Tank 8D-3 from the Vitrification Facility Vessel Vent Condenser System are also shown in Table 2 and were derived from the analytical results contained in Attachment B. This data is used to support a characterization methodology for Tank 8D-3 and is not used to calculate the radionuclide inventory.

Table 1

Typical Radionuclide Concentrations for
Decontaminated HLW Pretreatment Solutions
(Evaporator Concentrates)

Radionuclide	Decontaminated PUREX Supernatant[1] (μCi/ml)	Decontaminated PUREX Sludge Wash Solution[1] (μCi/ml)	Decontaminated PUREX/THOREX Sludge Wash Solutions[2] (μCi/ml)
C-14	1.91e-03	2.75e-03	2.51e-04
Tc-99	4.11e-01	2.75e-01	1.92e-01
I-129	1.35e-04	5.02e-05	6.23e-06
Np-237	2.72e-04	5.50e-05	2.36e-07
Pu-238	3.70e-02	3.20e-03	3.85e-05
Pu-239/240	1.68e-02	1.44e-03	1.75e-05
Pu-241	5.91e-01	3.46e-02	2.93e-04
Am-241	2.92e-03	1.52e-04	2.46e-06
Cm-243/244	3.00e-05	7.25e-06	4.58e-08
Cs-137	1.36e-01	1.85e-01	2.65e-01
Sr-90	6.93e-02	4.11e-03	1.79e-03

1 B&W Nuclear Environmental Services, Inc., Report No. 92:10274NL:01, "Data Reporting Package for West Valley Nuclear Services Company," dated December 1992.

2 Babcock & Wilcox, Research & Development Division, Report No. 9705052, Revision 1, "Data Reporting Package for West Valley Nuclear Services Company," dated June 24, 1997.

Table 2

Typical Radionuclide Concentrations for
Decontaminated SBWW Solutions and
CFMT Distillates

Radionuclide	Decontaminated SBWW from STS Processing [1] (μCi/ml)	CFMT Distillates [2] (μCi/ml)
Gross Alpha	8e-04	2.95e-04
Gross Beta	1e-02	3.67e-01
Pu-238	4e-05	6.40e-05
Pu-239/240	2e-05	2.89e-05
Total Alpha Pu	6e-05	9.30e-05
Cs-137	6e-04	1.04e-01

1 Averages from VAST Report 99-2205

2 Average of S-006 samples collected between January and April 1999

4.0 Technical Approach/Data Gathering

The technical approach for determining the radionuclide inventory of Tank 8D-3 will use existing results of processed and unprocessed SBWW samples and a projected future volume of waste remaining in Tank 8D-3 to calculate a bounding estimate.

The following assumptions are made in order to forecast the specific long-lived radionuclide inventory that will remain in Tank 8D-3 at the completion of SBWW processing in FY2003. Several of these assumptions are based on management decisions and the current plans for future operations:

- Once Vitrification is complete in FY2002, Tank 8D-3 will be used solely for the receipt of decontaminated SBWW liquids processed through the STS. It is very unlikely that any other material could be routed to this tank.
- At the completion of STS processing, a heel of 1,800 gallons of decontaminated SBWW will remain in Tank 8D-3 based on typical heel volumes left by the transfer pump.
- The pH of the SBWW will not be adjusted resulting in an increase or decrease in the present solubility of uranium in the SBWW. Some thought had been given to a pH adjustment, however, current plans do not call for this step.
- A decontamination factor of 10^3 for cesium is achieved by STS processing based on typical minimal decontamination factors demonstrated by the process[7].

Prior sample analyses from VAST Reports contained in Attachment C and shown in Table 3 of processed and unprocessed SBWW contained in Tank 8D-1 will be used to directly calculate a radionuclide inventory of the residual liquid heel which will remain in Tank 8D-3 following completion of SBWW STS processing in FY2003. This data has been validated per the CMP.

No significant amount of insoluble solids are expected to have accumulated in Tank 8D-3 since only CFMT distillates and filtered STS liquids were transferred into Tank 8D-3. The solutions processed through the STS are filtered through a sintered metal prefilter. Filtration prevents process contamination due to carryover of sludge particulates suspended in the process solution. The filter provides for a forward flow of 6 gpm and a 1 μm particle retention. Instrumentation to measure the pressure differential across the filter is provided. Provisions have been made for remotely back-pulsing the filter. The decontaminated STS solutions are processed through a sand bed type postfilter to remove zeolite fines that could recontaminate the process.

With the STS having processed over 1 million gallons of SBWW through Tank 8D-3 since 1995, it is reasonable to conclude that the contribution of HLW pretreatment liquids (pre-1995) to the Tank 8D-3 source term is trivial. In addition, the radionuclide composition of the CFMT overheads are consistent with the composition of decontaminated SBWW from STS processing with the exception of cesium as seen in Table 2.

Additionally, the Tank 8D-3 inventory due to corrosion/adsorption has been estimated to be less than 1 curie of predominantly Sr-90 as reported in WVDP-EIS-017[3]. As explained in WVDP-EIS-017, the major cause of Tank 8D-3 surface contamination is the deposition of an oxide corrosion film. The corrosion of the stainless steel materials used in the construction of Tank 8D-3 will give a film of Fe, Ni, and Cr oxides on the surface. This oxide film may have ion-exchange capacity, i.e., exchanging the Fe, Ni, and Cr for radionuclides. Once the oxide film is formed, it has an associated surface charge. The charged surface has an affinity for the ions in the solution, and the ions will deposit onto the surface via adsorption. Incorporation of radionuclides on the surface of the vessel (in the oxide film) and deposition of radioactive particles on the outer surface of the oxide film results in an insignificant contribution to the Tank 8D-3 inventory reported in Table 7.

Table 3

SBWW Analytical Results

	Tank 8D-1 SBWW	**Decontaminated SBWW (STS Effluent)**	**Decontaminated SBWW Concentrate (LWTS Evaporator Bottoms)**
VAST ID	01-0349	99-2205	99-2385
Date Collected	3/1/01	12/01/99	12/22/99
TDS (wt %)	1.0	1.00	31.8
Specific Gravity	1.01	1.01	1.24
pH	10	10	10.7
Uranium (μg/ml)	40	60.5	455
Project Isotopes	**μCi/gram**	**μCi/ml**	**μCi/ml**
C-14	no data	no data	no data
Tc-99	6e-03	6e-03	2e-01
I-129	no data	no data	no data
U-232	no data	no data	6e-03
U-233/234	no data	no data	4e-03
U-235/236	no data	3e-06[1]	1e-06
Np-237	2e-05	no data	no data
U-238	no data	no data	6e-05
Pu-238	9e-05	4e-05	1e-03
Pu-239/240	4e-05	2e-05	6e-04
Pu-241	no data	no data	no data
Am-241	6e-05	2e-06	7e-04
Cm-243/244	7e-06	no data	no data
Cs-137	1e+01	6e-04	2e+00
Sr-90	5e-01	2e-03	7e-02
Tank Farm SBWW Volume (gal)[2]	6e+05	6e+05	5e+05

1 U-235 isotope only.

2 Tank volume documented in the High-Level Waste Operations Daily Reports provided in Attachment D.

5.0 Sampling Procedure

As described above, no additional surveying or sampling of Waste Storage Tank 8D-3 is required to meet the objectives of the Facility Characterization Project as described in the CMP. Therefore, a description of implemented sampling procedures, sampling locations, etc., is not applicable.

6.0 Sampling Results/Data Validation

As described above, no additional surveying or sampling of Waste Storage Tank 8D-3 is required to meet the objectives of the Facility Characterization Project. Therefore, a description and tabulation of new sampling results is not applicable. Also the validation of such new sampling results is also not applicable.

7.0 Data Analysis

The forecasted radionuclide curie estimate shown in Table 4 was determined to be conservatively bounded based on an evaluation of existing data.

The forecasted specific long-lived radionuclide inventory that will remain in Tank 8D-3 at completion of SBWW processing in FY2003 has been developed based on an assessment of the facility design, process history, and forecasted process usage as an intermediate storage and sampling tank for the decontaminated SBWW as described in this report.

The long-lived isotopes that were assessed are C-14, Tc-99, I-129, U-232, U-233, U-234, U-235, U-238, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Cm-243, and Cm-244. In addition, Cs-137 and Sr-90 were assessed for purposes of providing scaling factors if necessary.

Based on the sample results and tank volumes reported in Table 3, a radionuclide inventory contained in the total volume of SBWW in the Waste Tank Farm at the time of sampling (March 2001) has been determined and is reported in Table 5. As expected, this proves to be consistent with the High-Level Waste Radionuclide Inventory Report as of July 31, 2001 for Tank 8D-1 supernatant.[13] Table 5 includes the uranium isotopes which were not previously reported.

The radionuclide concentrations for the current (August 2002) SBWW inventory of 132,100 gallons is calculated and presented in Table 6. Example inventory calculations are presented in Attachment E. As a result of the ongoing treatment of the SBWW through the zeolite columns in the STS, continued reduction of the Cs-137 content in Tank 8D-1 has been estimated from recent data (VAST ID 01-2357).[8] A Level I data validation for Cs-137 was completed per the CMP. After correcting for the Cs-137 removal from STS processing, the forecasted Tank 8D-3 radionuclide inventory that will remain at the completion of SBWW processing in FY2003 is also shown in Table 6 decayed to September 2004 (Attachment F).

8.0 Data Limitation

The curie estimates identified above were generated to meet the objectives of the Facility Characterization Project and to facilitate their potential use in the site's performance assessment model. The technical approach, model inputs and assumptions, and the conclusion that the generated curie estimates are conservatively bounding, has been reviewed and validated/approved by the project's Technical Review and Approval Panel (Attachment G) pursuant to the requirements of the CMP.

Table 4

Forecasted Tank 8D-3 Radionuclide Inventory
for an 1,800 Gallon Heel
(Decayed/Ingrown to September 2004)

Facility Characterization Project Isotopes	Projected Curies
C-14	1e-03
Tc-99	2e-01
I-129	8e-07
U-232	2e-02
U-233	1e-02
U-234	5e-03
U-235	2e-06
U-236	5e-06
Np-237	5e-04
U-238	2e-04
Pu-238	3e-03
Pu-239	5e-04
Pu-240	4e-04
Pu-241	2e-02
Am-241	2e-03
Cm-243	8e-06
Cm-244	2e-04
Cs-137	1e-01
Sr-90	2e+01

Table 5

Tank Farm SBWW Inventory

Project Isotopes	Curies			
	Calculated from VAST ID #01-0349 (As of March 2001)	Calculated[1] from VAST ID 99-2385 & 99-2205 (As of December 1999)	Calculated From Batch 10 Ratios (As of March 2001)	Summary
C-14			7e-02	7e-02
Tc-99	1e+01			1e+01
I-129			6e-05	6e-05
U-232[1]		2e+00		2e+00
U-233/234[1,2]		1e+00 U-233: 8e-01 U-234: 4e-01		1e+00 U-233: 8e-01 U-234: 4e-01
U-235/236[1,2]		4e-04 U-235: 1e-04 U-236: 3e-04		4e-04 U-235: 1e-04 U-236: 3e-04
Np-237	4e-02			4e-02
U-238[1]		2e-02		2e-02
Pu-238	2e-01			2e-01
Pu-239/240[2]	7e-02 Pu-239: 4e-02 Pu-240: 3e-02			7e-02 Pu-239: 4e-02 Pu-240: 3e-02
Pu-241			2e+00	2e+00
Am-241	1e-01			1e-01
Cm-243/244[2]	2e-02 Cm-243: 6e-04 Cm-244: 2e-02			2e-02 Cm-243: 6e-04 Cm-244: 2e-02
Cs-137[3]	7e+03			7e+03
Sr-90	1e+03			1e+03

1 SBWW Inventory Ci = Decontaminated SBWW concentrate radionuclide analysis x (uranium decontaminated SBWW μg/ml / uranium decontaminated SBWW concentrate μg/ml) x (Tank Farm volume).

2 U-233/234, U-235/236, Pu-239/240, and Cm-243/244: Analysis is performed via alpha spectroscopy in which separation between the isotopic peaks is not possible. Reported above are the values for the combined isotopes (as reported in the original laboratory data report) and the derived values for each of the isotopes based on URS 2002 Memo J. Wolniewicz to L. Michalczak, dated July 29, 2002.

3 Calculated from VAST Report 01-2357

Table 6

Tank 8D-3 SBWW Radionuclide Inventory[1]

Project Isotopes	SBWW at Tank Farm Inventory of 132,100 Gallons		Decontaminated SBWW in Tank 8D-3 Heel of 1,800 Gallons	
	Curies	μCi/ml	μCi/ml	Curies
C-14	7e-02	1e-04	1e-04	1e-03
Tc-99	1e+01	3e-02	3e-02	2e-01
I-129	6e-05	1e-07	1e-07	8e-07
U-232	2e+00	4e-03	4e-03	2e-02
U-233/234	1e+00 U-233: 8e-1 U-234: 4e-1	2e-03	2e-03	2e-02 U-233: 1e-2 U-234: 5e-3
U-235/236	4e-04 U-235: 1e-4 U-236: 3e-4	9e-07	9e-07	6e-06 U-235: 2e-6 U-236: 5e-6
Np-237	4e-02	8e-05	8e-05	5e-04
U-238	2e-02	4e-05	4e-05	2e-04
Pu-238	2e-01	4e-04	4e-04	3e-03
Pu-239/240	7e-02 Pu-239: 4e-2 Pu-240: 3e-2	1e-04	1e-04	9e-04 Pu-239: 5e-4 Pu-240: 4e-4
Pu-241	2e+00	3e-03	3e-03	2e-02
Am-241	1e-01	3e-04	3e-04	2e-03
Cm-243/244	2e-02 Cm-243: 6e-4 Cm-244: 2e-2	3e-05	3e-05	2e-04 Cm-243: 8e-6 Cm-244: 2e-4
Cs-137[2]	7e+03	1e+01	1e-02	1e-01
Sr-90[3]	1e+03	2e+00	2e+00	2e+01

1 Decayed through March 2001 with the exception of uranium isotopes which have been decayed through December 1999.

2 STS DF for Cs-137 of 10^3. SBWW Tank Farm inventory estimated from VAST ID 01-2357.

3 Includes 1 curie due to corrosion/adsorption.

9.0 References

1. WVDP-403, "Characterization Management Plan for the Facility Characterization Project," Revision 0, dated May 13, 2002.

2. WVNS Technical Paper, "High-Level Waste Radioactive Waste Pretreatment at the West Valley Demonstration Project," D. C. Meess, Waste Management '96, February 1996.

3. WVDP-EIS-017, "High-Level Waste Storage Area and Vitrification Facility Waste Characterization Report," Revision 1, dated September 28, 1995.

4. DOE/EIS-0226-D, "Draft Environmental Impact Statement for Completion of the West Valley Demonstration Project and Closure or Long-Term Management of Facilities at the Western New York Nuclear Service Center," dated January 1996.

5. B&W Nuclear Environmental Services, Inc., Report 92:10274NL:01, "Data Reporting Package for West Valley Nuclear Services Company," dated December 23, 1992.

6. Babcock & Wilcox Research & Development Division NEL Services, Report 9705052, Revision 1, "Data Reporting Package for West Valley Nuclear Services Company," dated June 24, 1997.

7. WVNSCO Internal Memorandum FG:2002:0007, G. M. Rhodes to J. M. Fazio, "Uranium Isotope Comparison Between D. V. Wallon's Reports and Ryyken Topical Report 14," dated July 9, 2002.

8. WVNSCO Letter WD:2002:0129, L. E. Rowell to A. C. Williams, "Response to Comments on the Waste Incidental to Reprocessing (WIR) Evaluation for Sodium-Bearing Waste Water (SBWW) at the West Valley Demonstration Project," dated March 5, 2002.

9. URS Memorandum, J. Wolniewicz to L. Michalczak, "Nuclide Ratios for Use in the Facility Characterization Project," dated July 29, 2002.

10. WVNSCO Internal Memorandum FG:2002:0011, G. M. Rhodes to J. M. Fazio, "STS Process "DF" from May 1999 to May 2002," dated July 12, 2002.

11. Pacific Northwest National Laboratory Report WVSP 00-28, "WVDP Radioactive Waste Characterization Letter Report - Part 1: Physical, Chemical, and Radiochemical Analytical Data," dated March 2000.

12. Pacific Northwest National Laboratory Report WVSP 01-07, "WVDP Radioactive Waste Characterization Letter Report - Part 3: Iodine-129 Measurement by Low Energy Photon Spectrometry (LEPS)," dated November 2000.

13. WVNSCO Report, "High-Level Waste Tanks 8D-1 and 8D-2 Radionuclide Inventory Report as of July 31, 2001," dated July 31, 2001.

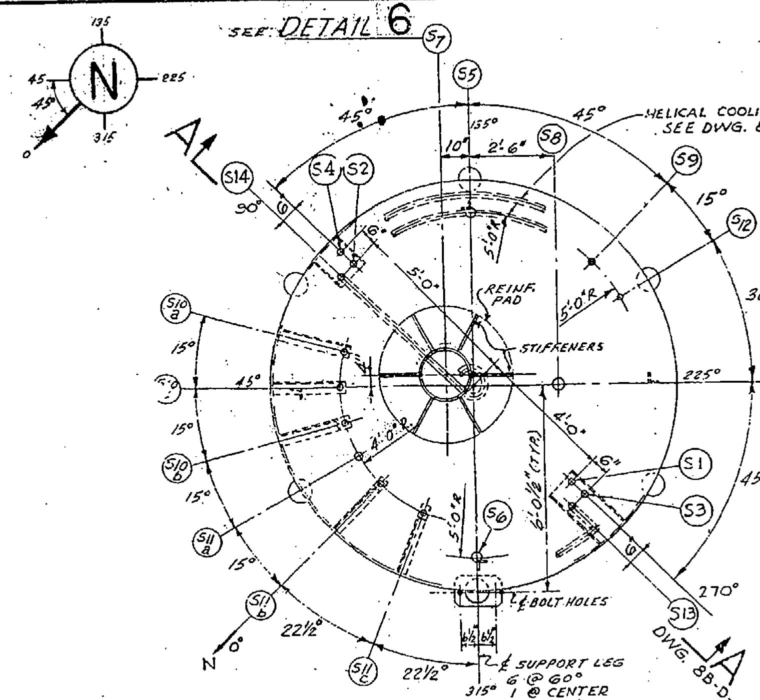
14. High-Level Waste Operations Daily Reports dated December 1, 1997, December 22, 1999, March 1, 2001, and August 30, 2002.

15. Hamel, W. F., McMahon, C. L., Meess, D. C., "Waste Removal from the west Valley Demonstration Project High-Level Radioactive Waste Storage Tanks," Waste Management 2000, February 2000.

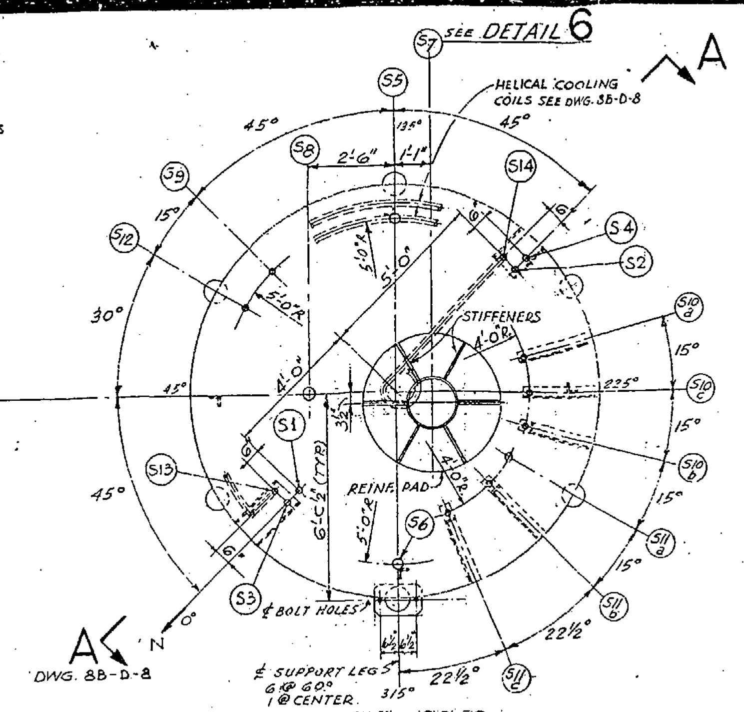
16. WVNSCO Topical Report DOE/NE/44139-83, "Integrated Radwaste Treatment System Final Report," October 1997.

Attachment A

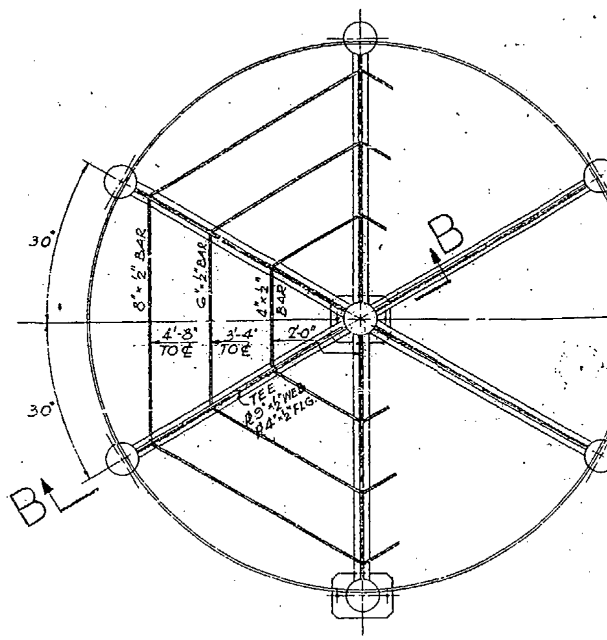
Bechtel Drawing 8B-D-4 - Waste Storage Tank 8D-3 Design Drawing



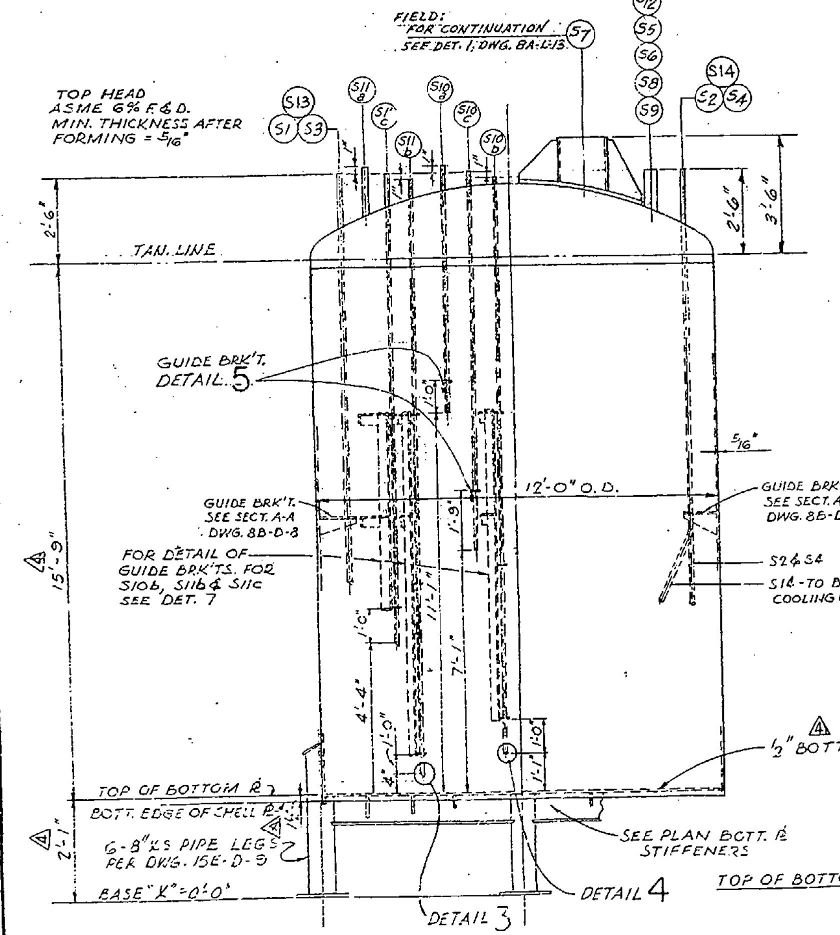
PLAN 8D-4



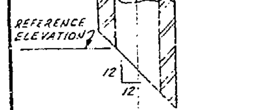
PLAN 8D-3



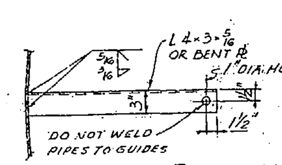
PLAN BOTTOM ℞ STIFFENERS
BOTT. ℞ NOT SHOWN



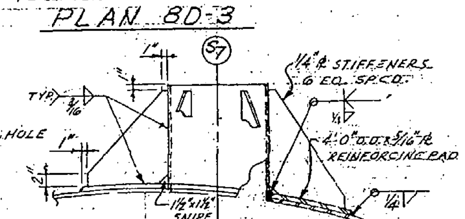
SCHEMATIC ELEVATION
TRUE ORIENTATIONS SHOWN IN PLANS
COOLING COILS NOT SHOWN
FOR ARRANGEMENT & DETAILS OF COILS SEE DWG. 8B-D-8



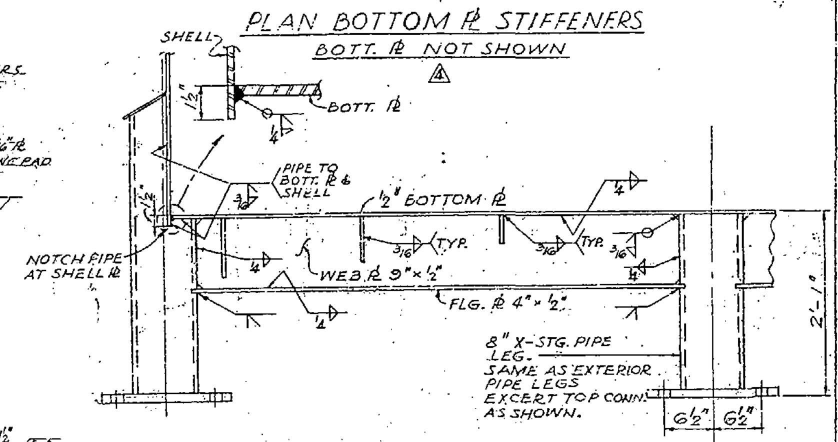
DETAIL 3
TYPICAL FOR S11b & S11c



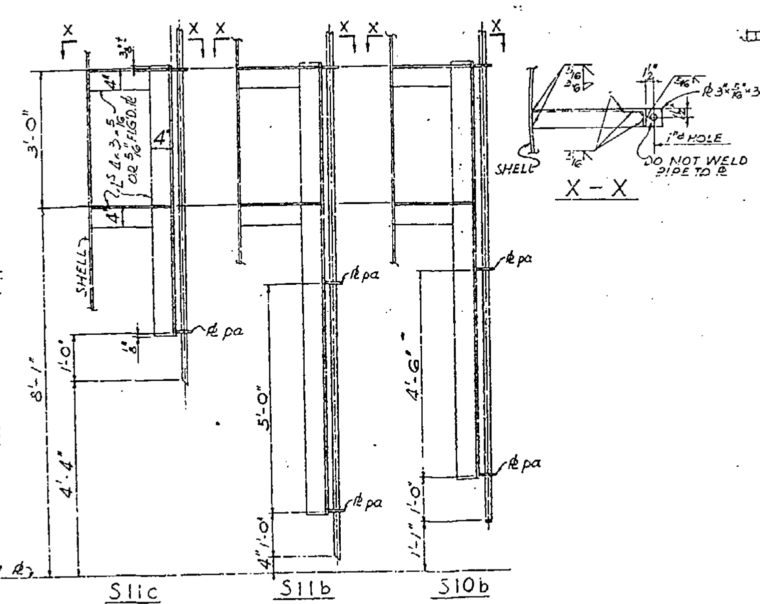
DETAIL 5
1 EA. REQ'D FOR S10a & S10c



DETAIL 6

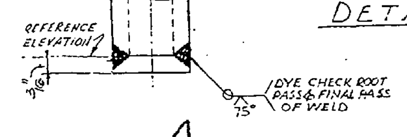


SECT. B-B TYPICAL



X-X

DETAIL 7



DETAIL 4
TYPICAL FOR S10a, S10b & S10c

NOTES FOR REVISION 4
DELETED: BOTTOM F & D. HEAD.
ADDED: FLAT PLATE HEAD W/STIFFENERS & PIPE LEG AT CENTER. PLAN OF BOTTOM STIFFENERS & SECT. B-B SHOWN.
REVISED: DIM. FROM TOP HD. TAN. LINE TO TOP OF BOTTOM ℞ & FROM ℞ TO BOTT. OF PIPE LEGS.

NOTES

1. DESIGN DATA:
   INTERNAL PRESSURE = 6 PSIG.
   TEMPERATURE (MAX. STORAGE) = 131°F
   TEMPERATURE (STEAM OUT) = 240°F
   CORROSION ALLOWANCE = 0.07"
2. FABRICATION TO BE IN ACCORDANCE WITH ASME CODE SECTION VIII AS APPLICABLE, AND SPEC. 4413-C-2. CODE STAMP NOT REQ'D.
3. MATERIAL:
   SHELL & HEADS ~ PLATE A-240 TP-304L
   INTERNAL ATTACHMENTS ~ A-240 TP-304L
   EXTERNAL SUPPORTS ~ TP-304 OR 304L
   PIPE - A-312 TP-304L SEAMLESS

   ADDITIONAL MATERIAL TESTING PER SPEC. 4413-C-2, PAR. 3.2 IS REQUIRED.
4. INSPECTION AND TESTING:
   (a) VESSEL TO BE 100% X-RAYED PER SPEC. 4413-C-2.
   (b) VESSEL TO BE HELIUM LEAK TESTED IN SHOP PER SPEC. 4413-C-2.
   (c) VESSEL TO BE HYDROSTATICALLY TESTED IN SHOP TO 30 PSIG AT TOP.
   (d) COILS TO BE TESTED PER SPEC. 4413-C-2, PAR. 5.2.
   (e) ALL BUTT WELDS IN COILS TO BE 100% X-RAYED.
5. CONNECTIONS:
   (a) SEE DWG. 15E-D-5 FOR DET. OF STUB NOZZLES.
   (b) EXCEPT AS OTHERWISE NOTED, PIPE WALL THICKNESS SHALL CONFORM TO THE FOLLOWING:
   1" & SMALLER = SCH. 160S
   1¼", 1½" & 2" = SCH. 80S
   3" THRU 6" = SCH. 40S
   (c) SEAMLESS LONG RADIUS WELDING FITTINGS SHALL BE USED UNLESS OTHERWISE NOTED.
   (d) CONNECTION TO VESSEL TO BE PER CODE FIG. UW-16.1 (c).
6. THE USE OF BACK-UP STRIPS WHICH REMAIN IN PLACE IS NOT ACCEPTABLE. (SEE NOTE 9.)
7. SHOP PAINT: NONE
8. NAME PLATE: NONE
   PROVIDE REMOVABLE METAL IDENTIFICATION TAG FOR SHIPPING. NO ATTACHMENTS OTHER THAN THOSE SHOWN SHALL BE WELDED TO VESSEL.
9. FOR SEAMS WHICH CANNOT BE WELDED FROM BOTH SIDES; ROOT PASSES TO BE MADE BY TUNGSTEN INERT GAS PROCESS.

REFERENCE DRAWINGS

STUB NOZZLE DETAILS — 15E-D-5
PIPE LEG SUPPORTS — 15E-D-9
COOLING COIL DETAILS — 8B-D-8

NOTES FOR REVISION 3
COOLING COILS REVISED AND REDRAWN, (DELETED ONE FLAT COIL, ADDED 2-HELICAL COOLING COILS, REVISED SIZE AND LOCATION OF BOTTOM COIL).
REVISED LOCATION AND SERVICE FOR S1, S2, S3 & S4.
REVISED GUIDES FOR S10 & S11.
REVISED CORROSION ALLOWANCE (WAS ⅛").
ADDED S13, S14 AND REF. DWGS.

NOTES FOR REVISION 1
REVISED & RENUMBERED CONNECTIONS.
REVISED LAYOUT FOR COOLING COILS.
ADDED ORIENTATIONS & DETAILS.

NOTES FOR REVISION 2
REVISED: LENGTH OF SUPPORT LEGS (WERE 3'-2")
INCREASED LENGTH OF INT. PIPES @ S11b & S11c.
SIZE OF S7 (WAS 24") SIZE OF S14 (WAS 1")
PROJECTION FOR S7 (WAS 2'-6" TO T.L.)
REORIENTED S7 & S11c
ADDED: CONN. S12, REINF. PAD & STIFFENERS @ S7.
GUIDE CLIP @ S11c.

NOZZLES

NOZZLE	SIZE	NO. REQ'D	DIM. "A" PER DWG. 15E-D-5	SERVICE	REMARKS
TANKS 8D-3 & 8D-4					
S1	1½"	1	0.145"	COOLING WATER INLET-INNER COIL	W/INT'L.
S2	1½"	1	0.145"	COOLING WATER OUTLET-INNER COIL	Do
S3	1½"	1	0.145"	COOLING WATER INLET-OUTER COIL	Do
S4	1½"	1	0.145"	COOLING WATER OUTLET-OUTER COIL	Do
S5	3"	1	0.216"	INLET FROM 7D-10	
S6	3"	1	0.216"	SPARE	
S7	18" O.D.	1	0.312"	ACCESS OPENING	18" O.D. × 5/16" R STUB
S8	4"	1	0.237"	VENT TO B.C.-1	
S9	1½"	1	0.145"	RE[illegible]RN FROM VAULT	
S10a	½"	1	0.147"	TI & TR CONNS	W/INTERNAL
S10b	½"	1	0.147"		DO
S10c	½"	1	0.147"		DO
S11a	½"	1	0.147"	LI, PR & LAH CONNS	
S11b	½"	1	0.147"		W/INTERNAL
S11c	½"	1	0.147"		W/INTERNAL
S12	1½"	1	0.147"	UTILITY AIR PURGE CONN.	
S13	1¼"	1	0.140"	COOLING WATER INLET, BOTTOM COIL	W/INTERNAL
S14	1¼"	1	0.140"	COOLING WATER OUTLET, BOTTOM COIL	W/INTERNAL

NOTE
ALL CONNECTIONS TO BE BEVELED INTERNALLY TO MATCH CONNECTING PIPE THICKNESS

NO.	DATE	REVISIONS	BY	CH'K	DFTG. SUPV'R	ENG'R	CHIEF ENG'R	CLIENT
4	3/18/66	SEE REVISION NOTE #4 AT LEFT	LSH	N.	RON			
3	2/8/65	SEE REVISION NOTE #3 ABOVE	LSH	N.	RON	[illegible]		
2	11/6/64	SEE REV. ON NOTES ABOVE	N.	EDE	RON			
1	7/29/64	SEE REVISION NOTES ABOVE ISSUED FOR COMPLETION OF [illegible]	N	N	RON			
0	10-4-63	ISSUED FOR QUOTATIONS	EDE		RON			

SCALE | DESIGNED | DRAWN EDE

BECHTEL CORPORATION
NEW YORK SAN FRANCISCO LOS ANGELES
ENGINEERING BY BECHTEL ASSOCIATES

NUCLEAR FUEL SERVICES, INC.
SPENT FUEL PROCESSING PLANT

CON-ED WASTE STORAGE TANKS
8D-3 & 8D-4

JOB No. 4413 | DRAWING No. 8B-D-4 | REV. 4

Attachment B

Analytical Sample Analysis Data for Sodium-Bearing Waste Water

VAST Reports 99-2205, 99-2385, 01-0349, and 01-2357

A&PC Report of Analysis

4301

Report Recipients: D.WALLON,J.CHRISTOPHER

Copied for Recipients ☑ FAXed to Recipients ☑ Copied for File ☑

package page 01 of 61

Login Date: 01-Dec-99 **VAST Sample ID:** 99-2205

Sample Point:	S-008	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-008 A&B
Collected:	12/1/99 2200		

Analysis	Result		Uncertainty	Lab Use Only
TIC	5.6E+2	ug/mL		Rep1 (S-008 A): U1
TIC	5.6E+2	ug/mL		Rep2 (S-008 B): U1
TOC	<5.1E+1	ug/mL		Rep1 (S-008 A): no flags
TOC	<5.1E+1	ug/mL		Rep2 (S-008 B): no flags
Density	1.007 (25.9 °C)	g/mL		Rep1 (S008 A): U1
Density	1.010 (25.9 °C)	g/mL		Rep2 (S008 B): U1
Cl	<5.02E+1	ug/mL		Rep1 (S-008 A): no flags
Cl	<5.02E+1	ug/mL		Rep2 (S-008 B): no flags
Cl	Not Measured	ug/mL		Rep3 (S-008 A): U1
Cl	Not Measured	ug/mL		Rep4 (S-008 B): U1
F	<2.51E+1	ug/mL		Rep1 (S-008 A): no flags
F	<2.51E+1	ug/mL		Rep2 (S-008 B): no flags

Approved By

Joanna Christopher — Name

12/16/99 @ 1000 — Date & Time

Login Date: 01-Dec-99 **VAST Sample ID:** 99-2205

Sample Point:	S-008
Sample Type:	IN PROCESS
Collected:	12/1/99 2200

Department	HLWO (WTF)
Customer's ID:	S-008 A&B

Analysis	Result		Uncertainty	Lab Use Only
F	Not Measured	ug/mL		Rep3 (S-008 A): U1
F	Not Measured	ug/mL		Rep4 (S-008 B): U1
NO2	Not Measured	ug/mL		Rep1 (S-008 A): U1
NO2	Not Measured	ug/mL		Rep2 (S-008 B): U1
NO2	2.94E+3	ug/mL		Rep3 (S-008 A): U1
NO2	2.94E+3	ug/mL		Rep4 (S-008 B): U1
NO3	Not Measured	ug/mL		Rep1 (S-008 A): U1
NO3	Not Measured	ug/mL		Rep2 (S-008 B): U1
NO3	8.79E+2	ug/mL		Rep3 (S-008 A): U1
NO3	8.64E+2	ug/mL		Rep4 (S-008 B): U1
PO4	<5.02E+1	ug/mL		Rep1 (S-008 A): no flags
PO4	<5.02E+1	ug/mL		Rep2 (S-008 B): no flags
PO4	Not Measured	ug/mL		Rep3 (S-008 A): U1
PO4	Not Measured	ug/mL		Rep4 (S-008 B): U1
SO4	1.23E+2	ug/mL		Rep1 (S-008 A): U1
SO4	1.23E+2	ug/mL		Rep2 (S-008 B): U1

Approved By

Joanna Christian — Name

12/16/99 @ 1000 — Date & Time

Login Date: 01-Dec-99 **VAST Sample ID:** 99-2205

Sample Point:	S-008	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-008 A&B
Collected:	12/1/99 2200		

Analysis	Result		Uncertainty	Lab Use Only
SO4	Not Measured	ug/mL		Rep3 (S-008 A): U1
SO4	Not Measured	ug/mL		Rep4 (S-008 B): U1
Al	<7.58E+0	ug/mL		Rep1 (S-008 #A): no flags
Al	<7.58E+0	ug/mL		Rep2 (S-008 #B): no flags
B	4.71E+1	ug/mL		Rep1 (S-008 #A): U1
B	4.85E+1	ug/mL		Rep2 (S-008 #B): U1
Ba	<1.01E+0	ug/mL		Rep1 (S-008 #A): no flags
Ba	<1.01E+0	ug/mL		Rep2 (S-008 #B): no flags
Ca	2.92E+0	ug/mL		Rep1 (S-008 #A): U1
Ca	2.76E+0	ug/mL		Rep2 (S-008 #B): U1
Cr	3.67E+1	ug/mL		Rep1 (S-008 #A): U1
Cr	3.77E+1	ug/mL		Rep2 (S-008 #B): U1
Fe	<2.53E+0	ug/mL		Rep1 (S-008 #A): no flags
Fe	<2.53E+0	ug/mL		Rep2 (S-008 #B): no flags
Hg	49.6	ng/mL		Rep1: U1
Hg	47.5	ng/mL		Rep2: U1

Approved By

Joanna Chris Bohe — Name

12/16/99 @ 1000 — Date & Time

Login Date: 01-Dec-99 **VAST Sample ID:** 99-2205

Sample Point:	S-008	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-008 A&B
Collected:	12/1/99 2200		

Analysis	Result		Uncertainty	Lab Use Only
K	5.36E+1	ug/mL		Rep1 (S-008 #A): U1
K	5.73E+1	ug/mL		Rep2 (S-008 #B): U1
Li	5.06E+0	ug/mL		Rep1 (S-008 #A): U1
Li	5.18E+0	ug/mL		Rep2 (S-008 #B): U1
Mg	<2.53E+0	ug/mL		Rep1 (S-008 #A): no flags
Mg	<2.53E+0	ug/mL		Rep2 (S-008 #B): no flags
Mn	<1.52E+0	ug/mL		Rep1 (S-008 #A): no flags
Mn	<1.52E+0	ug/mL		Rep2 (S-008 #B): no flags
Na	Not Measured	ug/mL		Rep1 (S-008 #A): U1
Na	Not Measured	ug/mL		Rep2 (S-008 #B): U1
Na	3.66E+3	ug/mL		Rep3 (S-008 #A): U1
Na	3.75E+3	ug/mL		Rep4 (S-008 #B): U1
P	<5.05E+0	ug/mL		Rep1 (S-008 #A): no flags
P	<5.05E+0	ug/mL		Rep2 (S-008 #B): no flags
Th	<1.01E+0	ug/mL		Rep1 (S-008 #A): no flags
Th	<1.01E+0	ug/mL		Rep2 (S-008 #B): no flags

Approved By

Joanna Z Chris Dogden — Name

12/16/99 @ 1000 — Date & Time

Login Date: 01-Dec-99 **VAST Sample ID:** 99-2205

Sample Point:	S-008	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-008 A&B
Collected:	12/1/99 2200		

Analysis	Result		Uncertainty	Lab Use Only
Ti	<1.26E+0	ug/mL		Rep1 (S-008 #A): no flags
Ti	<1.26E+0	ug/mL		Rep2 (S-008 #B): no flags
U	6.00E+1	ug/mL		Rep1 (S-008 #A): U1
U	6.10E+1	ug/mL		Rep2 (S-008 #B): U1
Zr	<2.53E+0	ug/mL		Rep1 (S-008 #A): no flags
Zr	<2.53E+0	ug/mL		Rep2 (S-008 #B): no flags
pH	10.0 (25 °C)	su	0.1	Rep1 (S-008 A): no flags
pH	10.0 (25 °C)	su	0.1	Rep2 (S-008 B): no flags
GrossAlpha	7.93E-4	uCi/mL	8.84E-5	Rep1 (S008 A): no flags
GrossAlpha	8.27E-4	uCi/mL	9.03E-5	Rep2 (S008 B): no flags
GrossBeta	1.48E-2	uCi/mL	2.97E-4	Rep1 (S008 A): no flags
GrossBeta	1.50E-2	uCi/mL	3.00E-4	Rep2 (S008 B): no flags
Pu-238	4.27E-5	uCi/mL	2.24E-6	Rep1 (A): no flags
Pu-238	4.24E-5	uCi/mL	2.53E-6	Rep2 (B): no flags
Pu-239+240	1.81E-5	uCi/mL	1.15E-6	Rep1 (A): no flags
Pu-239+240	1.81E-5	uCi/mL	1.31E-6	Rep2 (B): no flags

Approved By

Joanna Christopher — 12/16/99 @1000

Name — Date & Time

Login Date: 01-Dec-99 **VAST Sample ID:** 99-2205

Sample Point:	S-008	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-008 A&B
Collected:	12/1/99 2200		

Analysis	Result		Uncertainty	Lab Use Only
Sr 90	2.29E-3	uCi/mL	1.67E-4	Rep1 (S-008 A): no flags
Sr 90	2.27E-3	uCi/mL	1.67E-4	Rep2 (S-008 B): no flags
Tc 99	6.06E-3	uCi/mL	1.97E-4	Rep1 (S-008 -A): no flags
Tc 99	6.38E-3	uCi/mL	2.07E-4	Rep2 (S-008 -B): no flags
TotAlphaPu	6.08E-5	uCi/mL	3.38E-6	Rep1 (A): no flags
TotAlphaPu	6.05E-5	uCi/mL	3.84E-6	Rep2 (B): no flags
Am-241	1.75E-6	uCi/mL	7.35E-7	Rep1 (S-008 A): no flags
Am-241	1.40E-6	uCi/mL	6.36E-7	Rep2 (S-008 B): no flags
Co-60	4.60E-5	uCi/mL	1.24E-6	Rep1 (S-008 A): no flags
Co-60	4.56E-5	uCi/mL	9.60E-7	Rep2 (S-008 B): no flags
Cs-137	6.01E-4	uCi/mL	4.80E-6	Rep1 (S-008 A): no flags
Cs-137	5.67E-4	uCi/mL	3.60E-6	Rep2 (S-008 B): no flags
Sb-125	1.97E-5	uCi/mL	2.41E-6	Rep1 (S-008 A): no flags
Sb-125	1.94E-5	uCi/mL	1.85E-6	Rep2 (S-008 B): no flags
U-235	2.81E-6	uCi/mL	1.14E-6	Rep1 (S-008 A): no flags
U-235	3.62E-6	uCi/mL	9.10E-7	Rep2 (S-008 B): no flags

Approved By

Name

12/16/99 @ 1000
Date & Time

Login Date: 01-Dec-99 **VAST Sample ID:** 99-2205

Sample Point:	S-008	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-008 A&B
Collected:	12/1/99 2200		

Analysis	Result	Uncertainty	Lab Use Only
TDS	0.9632	%	Rep1 (S-008 A): U1
TDS	1.035	%	Rep2 (S-008 B): U1

NOTES: (Contact the A&PC Supervisor if you have questions.)

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer reported.

Lab Use Only Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected

U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Joanne Chris Fogler — 12/16/99 @ 1000

Name — Date & Time

VAST

Vitrification Analytical Sample Tracking

A&PC Report of Analysis

Report Recipients: D. STROUD, J. CHRISTOPHER

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package page 1 of 80

Login Date: *22-Dec-99* ***VAST Sample ID:*** *99-2385*

Sample Point:	5D-15A1	**Department**	HLWO (WTF)
Sample Type:	IP	**Customer's ID:**	WO 9902438-1
Collected:	12/22/99 2010		

Analysis	Result		Uncertainty	Lab Use Only
TIC	1.5E+4	ug/mL		Rep1 (5D15A1): U1
TIC	1.5E+4	ug/mL		Rep2 (5D15A1 DUP): U1
TOC	3.2E+2	ug/mL		Rep1 (5D15A1): U1
TOC	3.7E+2	ug/mL		Rep2 (5D15A1 DUP): U1
Density	1.243 (18.4 °C)	g/mL		Rep1 (5D-15A1): U1
Density	1.234 (21.3 °C)	g/mL		Rep2 (5D-15A1 repeat): U1
Cl	1.11E+3	ug/mL		Rep1 (5D-15A1 - I1): U1
Cl	Not Measured	ug/mL		Rep2 (5D-15A1 - I11): U1
Cl	Not Measured	ug/mL		Rep3 (5D-15A1 - I2): U1
Cl	1.09E+3	ug/mL		Rep4 (5D-15A1 - I1 DUP): U1
Cl	Not Measured	ug/mL		Rep5 (5D-15A1 - I11 DUP): U1
Cl	Not Measured	ug/mL		Rep6 (5D-15A1 - I2 DUP): U1

Approved By

Joanna Z Christopher — **Name**

2/24/00 @ 1625 — **Date & Time**

Report Date: *24-Feb-00*

Login Date: 22-Dec-99 **VAST Sample ID:** 99-2385

Sample Point:	5D-15A1	**Department**	HLWO (WTF)
Sample Type:	IP	**Customer's ID:**	WO 9902438-1
Collected:	12/22/99 2010		

Analysis	Result		Uncertainty	Lab Use Only
F	Not Measured	ug/mL		Rep1 (5D-15A1 - I1): U1
F	Not Measured	ug/mL		Rep2 (5D-15A1 - I11): U1
F	1.26E+2	ug/mL		Rep3 (5D-15A1 - I2): U1
F	Not Measured	ug/mL		Rep4 (5D-15A1 - I1 DUP): U1
F	Not Measured	ug/mL		Rep5 (5D-15A1 - I11 DUP): U1
F	<1.25E+2	ug/mL		Rep6 (5D-15A1 - I2 DUP): no flags
NO2	Not Measured	ug/mL		Rep1 (5D-15A1 - I1): U1
NO2	9.74E+4	ug/mL		Rep2 (5D-15A1 - I11): U1
NO2	Not Measured	ug/mL		Rep3 (5D-15A1 - I2): U1
NO2	Not Measured	ug/mL		Rep4 (5D-15A1 - I1 DUP): U1
NO2	1.03E+5	ug/mL		Rep5 (5D-15A1 - I11 DUP): U1
NO2	Not Measured	ug/mL		Rep6 (5D-15A1 - I2 DUP): U1
NO3	Not Measured	ug/mL		Rep1 (5D-15A1 - I1): U1
NO3	2.81E+4	ug/mL		Rep2 (5D-15A1 - I11): U1
NO3	Not Measured	ug/mL		Rep3 (5D-15A1 - I2): U1
NO3	Not Measured	ug/mL		Rep4 (5D-15A1 - I1 DUP): U1

Approved By

Joanna Christopher
Name

2/24/00 @ 1625
Date & Time

Login Date: 22-Dec-99 **VAST Sample ID:** 99-2385

Sample Point:	5D-15A1
Sample Type:	IP
Collected:	12/22/99 2010

Department	HLWO (WTF)
Customer's ID:	WO 9902438-1

Analysis	Result		Uncertainty	Lab Use Only
NO3	3.04E+4	ug/mL		Rep5 (5D-15A1 - I11 DUP): U1
NO3	Not Measured	ug/mL		Rep6 (5D-15A1 - I2 DUP): U1
PO4	Not Measured	ug/mL		Rep1 (5D-15A1 - I1): U1
PO4	Not Measured	ug/mL		Rep2 (5D-15A1 - I11): U1
PO4	7.04E+2	ug/mL		Rep3 (5D-15A1 - I2): U1
PO4	Not Measured	ug/mL		Rep4 (5D-15A1 - I1 DUP): U1
PO4	Not Measured	ug/mL		Rep5 (5D-15A1 - I11 DUP): U1
PO4	8.28E+2	ug/mL		Rep6 (5D-15A1 - I2 DUP): U1
SO4	3.92E+3	ug/mL		Rep1 (5D-15A1 - I1): U1
SO4	Not Measured	ug/mL		Rep2 (5D-15A1 - I11): U1
SO4	Not Measured	ug/mL		Rep3 (5D-15A1 - I2): U1
SO4	3.93E+3	ug/mL		Rep4 (5D-15A1 - I1 DUP): U1
SO4	Not Measured	ug/mL		Rep5 (5D-15A1 - I11 DUP): U1
SO4	Not Measured	ug/mL		Rep6 (5D-15A1 - I2 DUP): U1
Al	<3.89E+0	ug/mL		Rep1 (5D-15A1): no flags
Al	Not Measured	ug/mL		Rep2 (5D-15A1): U1

Approved By

Joanna Christopher — Name

2/24/00 @ 1625 — Date & Time

Report Date: 24-Feb-00

Login Date: 22-Dec-99 **VAST Sample ID:** 99-2385

Sample Point:	5D-15A1
Sample Type:	IP
Collected:	12/22/99 2010

Department	HLWO (WTF)
Customer's ID:	WO 9902438-1

Analysis	Result		Uncertainty	Lab Use Only
B	Not Measured	ug/mL		Rep1 (5D-15A1): U1
B	1.66E+3	ug/mL		Rep2 (5D-15A1): U1
B	1.31E+3	ug/mL		Rep3 (5D-15A1): U1
Ba	1.18E+0	ug/mL		Rep1 (5D-15A1): U1
Ba	Not Measured	ug/mL		Rep2 (5D-15A1): U1
Ca	3.70E+0	ug/mL		Rep1 (5D-15A1): U1
Ca	Not Measured	ug/mL		Rep2 (5D-15A1): U1
Cr	Not Measured	ug/mL		Rep1 (5D-15A1): U1
Cr	1.22E+3	ug/mL		Rep2 (5D-15A1): U1
Fe	<1.30E+0	ug/mL		Rep1 (5D-15A1): no flags
Fe	Not Measured	ug/mL		Rep2 (5D-15A1): U1
Hg	1140	ng/mL		Rep1 (5D-15 A1): U1
Hg	1240	ng/mL		Rep2 (5D-15 A1 DUP): U1
K	Not Measured	ug/mL		Rep1 (5D-15A1): U1
K	1.96E+3	ug/mL		Rep2 (5D-15A1): U1
K	1.69E+3	ug/mL		Rep3 (5D-15A1): U1

Approved By

Joanna Christopher — Name

2/24/00 @ 1625 — Date & Time

Login Date: 22-Dec-99 **VAST Sample ID:** 99-2385

Sample Point:	5D-15A1
Sample Type:	IP
Collected:	12/22/99 2010

Department	HLWO (WTF)
Customer's ID:	WO 9902438-1

Analysis	Result		Uncertainty	Lab Use Only
Li	Not Measured	ug/mL		Rep1 (5D-15A1): U1
Li	1.49E+2	ug/mL		Rep2 (5D-15A1): U1
Li	1.29E+2	ug/mL		Rep3 (5D-15A1): U1
Mg	2.67E+0	ug/mL		Rep1 (5D-15A1): U1
Mg	Not Measured	ug/mL		Rep2 (5D-15A1): U1
Mn	<7.78E-1	ug/mL		Rep1 (5D-15A1): no flags
Mn	Not Measured	ug/mL		Rep2 (5D-15A1): U1
Na	Not Measured	ug/mL		Rep1 (5D-15A1): U1
Na	1.14E+5	ug/mL		Rep2 (5D-15A1): U1
P	8.73E+1	ug/mL		Rep1 (5D-15A1): U1
P	Not Measured	ug/mL		Rep2 (5D-15A1): U1
Th	<5.19E-1	ug/mL		Rep1 (5D-15A1): no flags
Th	Not Measured	ug/mL		Rep2 (5D-15A1): U1
Ti	<6.48E-1	ug/mL		Rep1 (5D-15A1): no flags
Ti	Not Measured	ug/mL		Rep2 (5D-15A1): U1
U	Not Measured	ug/mL		Rep1 (5D-15A1): U1

Approved By

Joanna S Christopher
Name

2/24/00 @ 1625
Date & Time

Report Date: 24-Feb-00

Login Date: 22-Dec-99 **VAST Sample ID:** 99-2385

Sample Point:	5D-15A1	**Department**	HLWO (WTF)
Sample Type:	IP	**Customer's ID:**	WO 9902438-1
Collected:	12/22/99 2010		

Analysis	Result		Uncertainty	Lab Use Only
U	5.41E+2	ug/mL		Rep2 (5D-15A1): U1
U	3.68E+2	ug/mL		Rep3 (5D-15A1): U1
Zr	<1.30E+0	ug/mL		Rep1 (5D-15A1): no flags
Zr	Not Measured	ug/mL		Rep2 (5D-15A1): U1
pH	10.7 (22 °C)	su	0.1	Rep1 (5D-15A1): no flags
GrossAlpha	8.75E-3	uCi/mL	3.21E-3	Rep1 (5D-15A1): no flags
GrossBeta	2.57E+0	uCi/mL	2.97E-1	Rep1 (5D-15A1): no flags
Pu-238	Rejected	uCi/mL	Rejected	Rep1 (5D-15A1): A3
Pu-238	1.45E-3	uCi/mL	6.12E-5	Rep2 (5D-15A1 REPEAT): no flags
Pu-239+240	Rejected	uCi/mL	Rejected	Rep1 (5D-15A1): A3
Pu-239+240	6.19E-4	uCi/mL	2.91E-5	Rep2 (5D-15A1 REPEAT): no flags
Sr 90	7.18E-2	uCi/mL	1.50E-3	Rep1 (5D-15A1): no flags
Sr 90	7.37E-2	uCi/mL	1.54E-3	Rep2 (5D-15A1 DUP): no flags
Tc 99	2.06E-1	uCi/mL	6.33E-3	Rep1 (5D-15A1): no flags
Tc 99	2.33E-1	uCi/mL	7.15E-3	Rep2 (5D-15A1 DUP): no flags
TotAlphaPu	Rejected	uCi/mL	Rejected	Rep1 (5D-15A1): A3

Approved By

Joanna Christopher
Name

2/24/00 @ 1625
Date & Time

Login Date: 22-Dec-99 **VAST Sample ID:** 99-2385

Sample Point:	5D-15A1
Sample Type:	IP
Collected:	12/22/99 2010

Department	HLWO (WTF)
Customer's ID:	WO 9902438-1

Analysis		Result		Uncertainty	Lab Use Only
TotAlphaPu		2.06E-3	uCi/mL	9.04E-5	Rep2 (5D-15A1 REPEAT): no flags
U230	xHLW	Not Measured	uCi/mL		Rep1: U1
U232	xHLW	5.86E-3	uCi/mL		Rep1: U1
U232	xHLW	Not Logged	uCi/mL		Rep2: A1 U1
U233/234	xHLW	3.73E-3	uCi/mL		Rep1: U1
U233/234	xHLW	Not Logged	uCi/mL		Rep2: A1 U1
U235/236	xHLW	<1.48E-6	uCi/mL		Rep1: no flags
U235/236	xHLW	Not Logged	uCi/mL		Rep2: A1 U1
U238	xHLW	5.86E-5	uCi/mL		Rep1: U1
U238	xHLW	Not Logged	uCi/mL		Rep2: A1 U1
Am-241		6.96E-4	uCi/mL	3.54E-4	Rep1 (5D-15A1): no flags
Am-241		Not Logged	uCi/mL		Rep2 (5D-15A1 2nd Rpeat): A1
Am-241		Not Logged	uCi/mL		Rep3 (5D-15A1 Dup 2nd Repe): A1
Co-60		1.04E-3	uCi/mL	6.80E-5	Rep1 (5D-15A1): no flags
Co-60		Not Logged	uCi/mL	2.46E-4	Rep2 (5D-15A1 2nd Rpeat): A1
Co-60		Not Logged	uCi/mL	2.78E-4	Rep3 (5D-15A1 Dup 2nd Repe): A1

Approved By

Joanna Christopher
Name

2/24/00 @ 1625
Date & Time

Login Date: 22-Dec-99 **VAST Sample ID:** 99-2385

Sample Point:	5D-15A1
Sample Type:	IP
Collected:	12/22/99 2010

Department	HLWO (WTF)
Customer's ID:	WO 9902438-1

Analysis	Result		Uncertainty	Lab Use Only
Cs-137	1.87E+0	uCi/mL	3.00E-3	Rep1 (5D-15A1): no flags
Cs-137	1.85E+0	uCi/mL	1.10E-2	Rep2 (5D-15A1 2nd Rpeat): no flags
Cs-137	1.88E+0	uCi/mL	1.10E-2	Rep3 (5D-15A1 Dup 2nd Repe): no flags
TDS	32.19	%		Rep1 (5D15A1): U1
TDS	30.94	%		Rep2 (5D15A1 DUP): U1
TDS	32.28	%		Rep3 (5D15A1): U1

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer reported.

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Joanna Christopher
Name

2/24/00 @ 1625
Date & Time

Report Date: 24-Feb-00

A&PC Report of Analysis

Report Recipients: HLWO S/S (fax 4836) (4301, 4504)

Copied for Recipients ☐ **FAXed to Recipients** ☑ **Copied for File** ☑

package page 1 of 190

Login Date: *01-Mar-01* ***VAST Sample ID:*** *01-0349*

Sample Point:	S-007	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-007 #2 A-F (DAP)
Collected:	3/1/2001 2230		

Analysis	Result ***		Uncertainty	Lab Use Only
Density	1.01 (24.1 °C)	g/mL		Rep1 (S-007#2A): U1
Density	1.01 (24.1 °C)	g/mL		Rep2 (S-007#2B): U1
Density	1.01 (24.1 °C)	g/mL		Rep3 (S-007#2C): U1
Density	1.01 (24.1 °C)	g/mL		Rep4 (S-007#2D): U1
Density	1.01 (24.1 °C)	g/mL		Rep5 (S-007#2E): U1
Density	1.01 (24.1 °C)	g/mL		Rep6 (S-007#2F): U1
Al	<1.46E+1	ug/g		Rep7 (A REPEAT): no flags
Al	<1.44E+1	ug/g		Rep8 (B REPEAT): no flags
Al	<1.32E+1	ug/g		Rep9 (C REPEAT): no flags
Al	<1.91E+1	ug/g		Rep10 (D REPEAT): no flags
Al	<1.34E+1	ug/g		Rep11 (E REPEAT): no flags
Al	<1.44E+1	ug/g		Rep12 (F REPEAT): no flags
Ca	3.23E+0	ug/g		Rep7 (A REPEAT): U1
Ca	5.39E+0	ug/g		Rep8 (B REPEAT): U1
Ca	5.09E+0	ug/g		Rep9 (C REPEAT): U1
Ca	3.95E+0	ug/g		Rep10 (D REPEAT): U1
Ca	3.18E+0	ug/g		Rep11 (E REPEAT): U1
Ca	2.86E+0	ug/g		Rep12 (F REPEAT): U1
Fe	<4.86E+0	ug/g		Rep7 (A REPEAT): no flags
Fe	<4.80E+0	ug/g		Rep8 (B REPEAT): no flags

Approved By

Name

6/8/01 11:50
Date & Time

Report Date: *06-Jun-01*

Login Date: 01-Mar-01 **VAST Sample ID:** 01-0349

Sample Point:	S-007	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-007 #2 A-F (DAP)
Collected:	3/1/2001 2230		

Analysis	Result ***		Uncertainty	Lab Use Only
Fe	<4.41E+0	ug/g		Rep9 (C REPEAT): no flags
Fe	<6.36E+0	ug/g		Rep10 (D REPEAT): no flags
Fe	<4.46E+0	ug/g		Rep11 (E REPEAT): no flags
Fe	<4.81E+0	ug/g		Rep12 (F REPEAT): no flags
Mn	<2.92E+0	ug/g		Rep7 (A REPEAT): no flags
Mn	<2.88E+0	ug/g		Rep8 (B REPEAT): no flags
Mn	<2.65E+0	ug/g		Rep9 (C REPEAT): no flags
Mn	<3.82E+0	ug/g		Rep10 (D REPEAT): no flags
Mn	<2.68E+0	ug/g		Rep11 (E REPEAT): no flags
Mn	<2.88E+0	ug/g		Rep12 (F REPEAT): no flags
Si	<4.86E+1	ug/g		Rep7 (A REPEAT): no flags
Si	<4.80E+1	ug/g		Rep8 (B REPEAT): no flags
Si	<4.41E+1	ug/g		Rep9 (C REPEAT): no flags
Si	<6.36E+1	ug/g		Rep10 (D REPEAT): no flags
Si	<4.46E+1	ug/g		Rep11 (E REPEAT): no flags
Si	<4.81E+1	ug/g		Rep12 (F REPEAT): no flags
Th	<2.98E+0	ug/g		Rep7 (A REPEAT): no flags
Th	<3.11E+0	ug/g		Rep8 (B REPEAT): no flags
Th	<2.76E+0	ug/g		Rep9 (C REPEAT): no flags
Th	<3.81E+0	ug/g		Rep10 (D REPEAT): no flags
Th	<2.76E+0	ug/g		Rep11 (E REPEAT): no flags
Th	<3.11E+0	ug/g		Rep12 (F REPEAT): no flags
U	3.93E+1	ug/g		Rep7 (A REPEAT): U1
U	3.94E+1	ug/g		Rep8 (B REPEAT): U1
U	4.02E+1	ug/g		Rep9 (C REPEAT): U1
U	4.03E+1	ug/g		Rep10 (D REPEAT): U1
U	4.11E+1	ug/g		Rep11 (E REPEAT): U1

Approved By

Judith A K L — Name

6/8/01 11:50 — Date & Time

Report Date: 06-Jun-01

pg 3 includes pg 3a (1 of 1)

Login Date: 01-Mar-01

VAST Sample ID: 01-0349

Sample Point:	S-007
Sample Type:	IN PROCESS
Collected:	3/1/2001 2230

Department	HLWO (WTF)
Customer's ID:	S-007 #2 A-F (DAP)

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Analysis	Result ***		Uncertainty	Lab Use Only
U	3.82E+1	ug/g		Rep12 (F REPEAT): U1
GrossAlpha	<4.94E-3	uCi/g		Rep1 (S-007 #2 A DB): no flags
GrossAlpha	<5.49E-3	uCi/g		Rep2 (S-007 #2 B DB): no flags
GrossAlpha	<4.71E-3	uCi/g		Rep3 (S-007 #2 C DB): no flags
GrossAlpha	<4.29E-3	uCi/g		Rep4 (S-007 #2 D DB): no flags
GrossAlpha	<4.73E-3	uCi/g		Rep5 (S-007 #2 E DB): no flags
GrossAlpha	<4.82E-3	uCi/g		Rep6 (S-007 #2 F DB): no flags
GrossBeta	1.60E+1	uCi/g	3.00E-1	Rep1 (S-007 #2 A DB): no flags
GrossBeta	1.58E+1	uCi/g	3.03E-1	Rep2 (S-007 #2 B DB): no flags
GrossBeta	1.74E+1	uCi/g	3.19E-1	Rep3 (S-007 #2 C DB): no flags
GrossBeta	1.70E+1	uCi/g	3.10E-1	Rep4 (S-007 #2 D DB): no flags
GrossBeta	1.59E+1	uCi/g	2.96E-1	Rep5 (S-007 #2 E DB): no flags
GrossBeta	1.67E+1	uCi/g	3.09E-1	Rep6 (S-007 #2 F DB): no flags
pH	10.0 (24 °C)	su	0.1	Rep1 (S-007#2A): no flags
pH	10.0 (24 °C)	su	0.1	Rep2 (S-007#2B): no flags
pH	10.0 (24 °C)	su	0.1	Rep3 (S-007#2C): no flags
pH	10.0 (24 °C)	su	0.1	Rep4 (S-007#2D): no flags
pH	10.0 (24 °C)	su	0.1	Rep5 (S-007#2E): no flags
pH	10.0 (24 °C)	su	0.1	Rep6 (S-007#2F): no flags
~~Sr90~~	~~2.75E-1~~	~~uCi/g~~	~~5.85E-3~~	~~Rep1 (S-007 ADB)~~: no flags
Sr90	2.37E-1	uCi/g	5.05E-3	Rep2 (S-007 BDB): no flags
Sr90	2.07E-1	uCi/g	4.39E-3	Rep3 (S-007 CDB): no flags
Sr90	2.45E-1	uCi/g	5.17E-3	Rep4 (S-007 DDB): no flags
Sr90	2.43E-1	uCi/g	5.13E-3	Rep5 (S-007 EDB): no flags
~~Sr90~~	~~2.45E-1~~	~~uCi/g~~	~~5.15E-3~~	~~Rep6 (S-007 FDB)~~: no flags
Tc99	5.55E-3	uCi/g	1.87E-4	Rep1 (A DB): no flags
Tc99	5.52E-3	uCi/g	1.89E-4	Rep2 (B DB): no flags

AK 8/30/01 — See pg 3a for 90Sr data.

Approved By

Name: [signature] Date & Time: 6/8/01 11:50

Report Date: 06-Jun-01

Login Date: 01-Mar-01 **VAST Sample ID:** 01-0349

Sample Point:	S-007
Sample Type:	IN PROCESS
Collected:	3/1/2001 2230

Department	HLWO (WTF)
Customer's ID:	S-007 #2 A-F (DAP)

Analysis	Result ***		Uncertainty	Lab Use Only
U	3.82E+1	ug/g		Rep12 (F REPEAT): U1
GrossAlpha	<4.94E-3	uCi/g		Rep1 (S-007 #2 A DB): no flags
GrossAlpha	<5.49E-3	uCi/g		Rep2 (S-007 #2 B DB): no flags
GrossAlpha	<4.71E-3	uCi/g		Rep3 (S-007 #2 C DB): no flags
GrossAlpha	<4.29E-3	uCi/g		Rep4 (S-007 #2 D DB): no flags
GrossAlpha	<4.73E-3	uCi/g		Rep5 (S-007 #2 E DB): no flags
GrossAlpha	<4.82E-3	uCi/g		Rep6 (S-007 #2 F DB): no flags
GrossBeta	1.60E+1	uCi/g	3.00E-1	Rep1 (S-007 #2 A DB): no flags
GrossBeta	1.58E+1	uCi/g	3.03E-1	Rep2 (S-007 #2 B DB): no flags
GrossBeta	1.74E+1	uCi/g	3.19E-1	Rep3 (S-007 #2 C DB): no flags
GrossBeta	1.70E+1	uCi/g	3.10E-1	Rep4 (S-007 #2 D DB): no flags
GrossBeta	1.59E+1	uCi/g	2.96E-1	Rep5 (S-007 #2 E DB): no flags
GrossBeta	1.67E+1	uCi/g	3.09E-1	Rep6 (S-007 #2 F DB): no flags
pH	10.0 (24 °C)	su	0.1	Rep1 (S-007#2A): no flags
pH	10.0 (24 °C)	su	0.1	Rep2 (S-007#2B): no flags
pH	10.0 (24 °C)	su	0.1	Rep3 (S-007#2C): no flags
pH	10.0 (24 °C)	su	0.1	Rep4 (S-007#2D): no flags
pH	10.0 (24 °C)	su	0.1	Rep5 (S-007#2E): no flags
pH	10.0 (24 °C)	su	0.1	Rep6 (S-007#2F): no flags
Sr90	5.39E-1	uCi/g	1.15E-2	Rep1 (S-007 ADB): no flags
Sr90	5.39E-1	uCi/g	1.15E-2	Rep2 (S-007 BDB): no flags
Sr90	5.17E-1	uCi/g	1.10E-2	Rep3 (S-007 CDB): no flags
Sr90	5.03E-1	uCi/g	1.06E-2	Rep4 (S-007 DDB): no flags
Sr90	5.25E-1	uCi/g	1.11E-2	Rep5 (S-007 EDB): no flags
Sr90	5.32E-1	uCi/g	1.12E-2	Rep6 (S-007 FDB): no flags
Tc99	5.55E-3	uCi/g	1.87E-4	Rep1 (A DB): no flags
Tc99	5.52E-3	uCi/g	1.89E-4	Rep2 (B DB): no flags

Approved By

Judith A. Kraft — **Name**

8/30/01 13:40 — **Date & Time**

Report Date: 27-Aug-01

Login Date: 01-Mar-01

VAST Sample ID: 01-0349

Sample Point:	S-007
Sample Type:	IN PROCESS
Collected:	3/1/2001 2230

Department	HLWO (WTF)
Customer's ID:	S-007 #2 A-F (DAP)

Analysis	Result ***		Uncertainty	Lab Use Only
Tc99	5.73E-3	uCi/g	1.92E-4	Rep3 (C DB): no flags
Tc99	5.56E-3	uCi/g	1.85E-4	Rep4 (D DB): no flags
Tc99	5.72E-3	uCi/g	1.92E-4	Rep5 (E DB): no flags
Tc99	5.57E-3	uCi/g	1.88E-4	Rep6 (F DB): no flags
Am241	7.29E-5	uCi/g	6.36E-6	Rep1 (A): no flags ** per Acm-2707 analys
Am241	5.33E-5	uCi/g	5.23E-6	Rep2 (B): no flags **
Am241	4.96E-5	uCi/g	5.91E-6	Rep3 (C): no flags **
Am241	6.06E-5	uCi/g	6.01E-6	Rep4 (D): no flags **
Am241	6.38E-5	uCi/g	5.79E-6	Rep5 (E): no flags **
Am241	5.56E-5	uCi/g	5.71E-6	Rep6 (F): no flags **
Am243	1.44E-6	uCi/g	1.29E-7	Rep1 (A): no flags
Am243	1.05E-6	uCi/g	1.06E-7	Rep2 (B): no flags
Am243	9.81E-7	uCi/g	1.19E-7	Rep3 (C): no flags
Am243	1.20E-6	uCi/g	1.22E-7	Rep4 (D): no flags
Am243	1.26E-6	uCi/g	1.18E-7	Rep5 (E): no flags
Am243	1.10E-6	uCi/g	1.15E-7	Rep6 (F): no flags
Cm242	<2.82E-7	uCi/g		Rep1 (A): no flags
Cm242	<3.07E-7	uCi/g		Rep2 (B): no flags
Cm242	<5.20E-7	uCi/g		Rep3 (C): no flags
Cm242	<3.63E-7	uCi/g		Rep4 (D): no flags
Cm242	<2.85E-7	uCi/g		Rep5 (E): no flags
Cm242	<3.71E-7	uCi/g		Rep6 (F): no flags
Cm243/244	9.43E-6	uCi/g	1.76E-6	Rep1 (A): no flags
Cm243/244	4.03E-6	uCi/g	1.16E-6	Rep2 (B): no flags
Cm243/244	6.80E-6	uCi/g	1.94E-6	Rep3 (C): no flags
Cm243/244	5.21E-6	uCi/g	1.44E-6	Rep4 (D): no flags
Cm243/244	9.30E-6	uCi/g	1.76E-6	Rep5 (E): no flags

Approved By

Name

6/8/01 11:50
Date & Time

Report Date: 06-Jun-01

Login Date: 01-Mar-01 **VAST Sample ID:** 01-0349

Sample Point:	S-007
Sample Type:	IN PROCESS
Collected:	3/1/2001 2230

Department	HLWO (WTF)
Customer's ID:	S-007 #2 A-F (DAP)

Analysis	Result ***		Uncertainty	Lab Use Only
Cm243/244	6.74E-6	uCi/g	1.67E-6	Rep6 (F): no flags
Np237	1.95E-5	uCi/g	1.95E-6	Rep1 (A): no flags
Np237	1.83E-5	uCi/g	2.59E-6	Rep2 (B): no flags
Np237	1.67E-5	uCi/g	1.77E-6	Rep3 (C): no flags
Np237	1.51E-5	uCi/g	2.45E-6	Rep4 (D): no flags
Np237	1.74E-5	uCi/g	2.33E-6	Rep5 (E): no flags
Np237	1.75E-5	uCi/g	2.51E-6	Rep6 (F): no flags
Pu-238	9.82E-5	uCi/g	1.19E-5	Rep1 (A): no flags
Pu-238	7.41E-5	uCi/g	1.19E-5	Rep2 (B): no flags
Pu-238	1.06E-4	uCi/g	1.25E-5	Rep3 (C): no flags
Pu-238	8.32E-5	uCi/g	1.09E-5	Rep4 (D): no flags
Pu-238	9.84E-5	uCi/g	1.06E-5	Rep5 (E): no flags
Pu-238	8.45E-5	uCi/g	1.04E-5	Rep6 (F): no flags
Pu-239+240	4.02E-5	uCi/g	5.85E-6	Rep1 (A): no flags
Pu-239+240	3.39E-5	uCi/g	5.87E-6	Rep2 (B): no flags
Pu-239+240	3.23E-5	uCi/g	5.45E-6	Rep3 (C): no flags
Pu-239+240	3.74E-5	uCi/g	5.54E-6	Rep4 (D): no flags
Pu-239+240	3.94E-5	uCi/g	5.15E-6	Rep5 (E): no flags
Pu-239+240	3.05E-5	uCi/g	4.75E-6	Rep6 (F): no flags
Pu242	<3.14E-9	uCi/g		Rep1 (A): no flags
Pu242	<2.37E-9	uCi/g		Rep2 (B): no flags
Pu242	<3.39E-9	uCi/g		Rep3 (C): no flags
Pu242	<2.66E-9	uCi/g		Rep4 (D): no flags
Pu242	<3.15E-9	uCi/g		Rep5 (E): no flags
Pu242	<2.71E-9	uCi/g		Rep6 (F): no flags
TotAlphaPu	1.38E-4	uCi/g	1.78E-5	Rep1 (A): no flags
TotAlphaPu	1.08E-4	uCi/g	1.78E-5	Rep2 (B): no flags

Approved By

Judith a Kmet
Name

6/8/01 11:50
Date & Time

Report Date: 06-Jun-01

Login Date: 01-Mar-01 **VAST Sample ID:** 01-0349

Sample Point:	S-007
Sample Type:	IN PROCESS
Collected:	3/1/2001 2230

Department	HLWO (WTF)
Customer's ID:	S-007 #2 A-F (DAP)

Analysis	Result ***		Uncertainty	Lab Use Only
TotAlphaPu	1.38E-4	uCi/g	1.79E-5	Rep3 (C): no flags
TotAlphaPu	1.21E-4	uCi/g	1.64E-5	Rep4 (D): no flags
TotAlphaPu	1.38E-4	uCi/g	1.57E-5	Rep5 (E): no flags
TotAlphaPu	1.15E-4	uCi/g	1.51E-5	Rep6 (F): no flags
* Am-241	<1.22E-3	uCi/g		Rep1 (S-007 #2 A-DB): no flags * per Acm-3104 analysis
* Am-241	<1.04E-3	uCi/g		Rep2 (S-007 #2 B-DB): no flags
* Am-241	<1.09E-3	uCi/g		Rep3 (S-007 #2 C-DB): no flags
* Am-241	<1.70E-3	uCi/g		Rep4 (S-007 #2 D-DB): no flags
* Am-241	<1.27E-3	uCi/g		Rep5 (S-007 #2 E-DB): no flags
* Am-241	<1.53E-3	uCi/g		Rep6 (S-007 #2 F-DB): no flags
Co-60	3.01E-4	uCi/g	2.13E-4	Rep1 (S-007 #2 A-DB): no flags
Co-60	2.75E-4	uCi/g	2.72E-4	Rep2 (S-007 #2 B-DB): no flags
Co-60	3.74E-4	uCi/g	2.21E-4	Rep3 (S-007 #2 C-DB): no flags
Co-60	8.62E-4	uCi/g	4.20E-4	Rep4 (S-007 #2 D-DB): no flags
Co-60	6.22E-4	uCi/g	3.94E-4	Rep5 (S-007 #2 E-DB): no flags
Co-60	4.09E-4	uCi/g	3.57E-4	Rep6 (S-007 #2 F-DB): no flags
Cs-137	1.35E+1	uCi/g	5.41E-1	Rep1 (S-007 #2 A-DB): no flags
Cs-137	1.24E+1	uCi/g	7.93E-1	Rep2 (S-007 #2 B-DB): no flags
Cs-137	1.43E+1	uCi/g	6.53E-1	Rep3 (S-007 #2 C-DB): no flags
Cs-137	1.40E+1	uCi/g	5.60E-1	Rep4 (S-007 #2 D-DB): no flags
Cs-137	1.29E+1	uCi/g	8.22E-1	Rep5 (S-007 #2 E-DB): no flags
Cs-137	1.38E+1	uCi/g	6.26E-1	Rep6 (S-007 #2 F-DB): no flags
Tot Solids	1.011	%		Rep2 (S007 #2 B): U1
Tot Solids	1.029	%		Rep7 (S007 #2 A REPEAT): U1
Tot Solids	1.010	%		Rep8 (S007#2C REPEAT): U1
Tot Solids	0.9736	%		Rep9 (S007 #2 D REPEAT): U1
Tot Solids	0.9935	%		Rep10 (S007 #2 E REPEAT): U1

Approved By

Judith a Kent
Name

6/8/01 11:50
Date & Time

Report Date: 06-Jun-01

Login Date: 01-Mar-01 **VAST Sample ID:** 01-0349

Sample Point:	S-007	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-007 #2 A-F (DAP)
Collected:	3/1/2001 2230		

Analysis	Result ***	Uncertainty	Lab Use Only
Tot Solids	0.9846 %		Rep11 (S007 #2F REPEAT): U1

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

*** The instrument used to determine gamma measurements is calibrated for samples of a specified matrix. The density associated with oil samples is not consistent with that of the specified sample matrix. Therefore, due to matrix of the sample and the unknown accuracy in which the sample was prepared, gamma results associated with oil samples are approximate.

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected

U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Judith a Kirk
Name

6/8/01 11:30
Date & Time

Report Date: 06-Jun-01

A&PC Report of Analysis

Report Recipients: HLWO S/S (fax 4836) G. RHODES (Fax 4504)

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package page 1 of 20

Login Date: *08-Nov-01* ***VAST Sample ID:*** *01-2357*

Sample Point:	S-007	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-007 #11
Collected:	11/8/2001 1450		

Analysis	Result ***		Uncertainty	Lab Use Only
Density	0.991 (21.6 °C)	g/mL		Rep1 (S007#11): U1
NO2	7.73E+3	ug/mL		Rep1 (S-007#11): U1
NO3	2.34E+3	ug/mL		Rep1 (S-007#11): U1
Na	9.21E+3	ug/mL		Rep1 (S-007 #11): U1
U	7.55E+1	ug/mL		Rep1 (S-007 #11): U1
GrossAlpha	<6.08E-3	uCi/mL		Rep1 (S-007 #11): no flags
GrossBeta	1.70E+1	uCi/mL	3.27E-1	Rep1 (S-007 #11): no flags
pH	10.3 (26 °C)	su	0.1	Rep1 (S007#11): no flags
Pu-238	1.92E-4	uCi/mL	1.50E-5	Rep2 (S-007 #11 repeat): no flags
Pu-239+240	8.28E-5	uCi/mL	8.00E-6	Rep2 (S-007 #11 repeat): no flags
TotAlphaPu	2.75E-4	uCi/mL	2.30E-5	Rep2 (S-007 #11 repeat): no flags
Cs-137	1.42E+1	uCi/mL	3.87E-1	Rep1 (S-007#11): no flags
TDS	2.653	%		Rep1 (s007#11): U1

Approved By

Name

11/19/01 1701
Date & Time

Report Date: *19-Nov-01*

Login Date: 08-Nov-01

VAST Sample ID: 01-2357

Sample Point:	S-007	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-007 #11
Collected:	11/8/2001 1450		

Analysis	Result ***	Uncertainty	Lab Use Only

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

*** The instrument used to determine gamma measurements is calibrated for samples of a specified matrix. The density associated with oil samples is not consistent with that of the specified sample matrix. Therefore, due to matrix of the sample and the unknown accuracy in which the sample was prepared, gamma results associated with oil samples are approximate.

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected

U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Name

11/19/01 1701
Date & Time

Report Date: 19-Nov-01

Attachment C

S-006 Radiochemical Sample Analyses of CFMT Distillates

VAST Reports 99-0231, 99-0303, 99-0372, 99-0454, 99-0558, 99-0625, 99-0657, 99-0670, 99-0723, 99-0780, and 99-0800

A&PC Report of Analysis

Report Recipients: HLWO S/S

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package page 1 of 15

Login Date: *29-Jan-99* ***VAST Sample ID:*** *99-0231*

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	
Collected:	1/29/99 1640		

Analysis	Result		Uncertainty	Lab Use Only
Density	1.000 (23.5 °C)	g/mL		Rep1 (S-006 #1): U1
U	<1.00E+0	ug/mL		Rep1 (S006 #1): no flags
pH	2.8 (24 °C)	su	0.1	Rep1 (s-006 #1): no flags
GrossAlpha	4.96E-4	uCi/mL	7.22E-5	Rep1 (S-006 #1): no flags
GrossBeta	1.25E-1	uCi/mL	8.22E-4	Rep1 (S-006 #1): no flags
Pu-238	1.37E-4	uCi/mL	8.52E-6	Rep1 (Q2704A0001): no flags
Pu-239+240	6.43E-5	uCi/mL	4.56E-6	Rep1 (Q2704A0001): no flags
TotAlphaPu	2.01E-4	uCi/mL	1.31E-5	Rep1 (Q2704A0001): no flags
Cs-137	2.64E-2	uCi/mL	1.40E-4	Rep1 (S-006 1): no flags
TDS	<0.2773	%		Rep1 (S006 #1): no flags

Approved By

Susan E. Jurgen — Name

2/4/99 2330 — Date & Time

Login Date: 29-Jan-99 **VAST Sample ID:** 99-0231

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	
Collected:	1/29/99 1640		

Analysis	Result	Uncertainty	Lab Use Only

NOTES: (Contact the A&PC Supervisor if you have questions.)

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer repo

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Susan R. Tingue
Name

2/4/99 2330
Date & Time

A&PC Report of Analysis

Report Recipients: HLWO S/S

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Login Date: *08-Feb-99* ***VAST Sample ID:*** *99-0303*

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #2
Collected:	2/8/99 0800		

Analysis	Result		Uncertainty	Lab Use Only
Density	1.001 (21.0 °C)	g/mL		Rep1 (S-006 #2): U1
U	<1.00E+0	ug/mL		Rep1 (S-006 #2): no flags
pH	4.62 (24 °C)	su	0.05	Rep1 (S-006 #2): no flags
GrossAlpha	3.61E-4	uCi/mL	6.27E-5	Rep1 (S-006 #2): no flags
GrossBeta	9.55E-2	uCi/mL	7.25E-4	Rep1 (S-006 #2): no flags
Pu-238	9.66E-5	uCi/mL	6.46E-6	Rep1 (Q2704A0001): no flags
Pu-239+240	4.50E-5	uCi/mL	3.33E-6	Rep1 (Q2704A0001): no flags
TotAlphaPu	1.42E-4	uCi/mL	9.79E-6	Rep1 (Q2704A0001): no flags
Cs-137	2.32E-2	uCi/mL	1.20E-4	Rep1 (S006 #2): A0 A0 A0
TDS	<0.1052	%		Rep1 (S-006 #2): no flags

Approved By

Susan G Tingen — **Name**

2/11/99 2345 — **Date & Time**

Report Date: *11-Feb-99*

Login Date: 08-Feb-99 **VAST Sample ID:** 99-0303

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #2
Collected:	2/8/99 0800		

Analysis	Result	Uncertainty	Lab Use Only

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer repo

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Name

2/11/99 2315
Date & Time

A&PC Report of Analysis

Report Recipients: STS S/S

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package page 1 of 18

Login Date: *15-Feb-99* ***VAST Sample ID:*** *99-0372*

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #3
Collected:	2/14/99 1430		

Analysis	Result		Uncertainty	Lab Use Only
Density	1.007 (21.0 °C)	g/mL		Rep1 (S006 3): U1
U	Rejected	ug/mL		Rep1 (S006 #3): A3
U	Rejected	ug/mL		Rep2 (REPEAT): A3
U	<1.00E+0	ug/mL		Rep3 (REPEAT): no flags
pH	3.82 (23 °C)	su	0.05	Rep1 (S006 #3): no flags
GrossAlpha	8.28E-5	uCi/mL	9.37E-5	Rep1 (S-006 #3): no flags
GrossBeta	1.58E-2	uCi/mL	9.39E-4	Rep1 (S-006 #3): no flags
Pu-238	2.32E-5	uCi/mL	5.38E-6	Rep1 (S006 #3): no flags
Pu-239+240	9.60E-6	uCi/mL	2.17E-6	Rep1 (S006 #3): no flags
TotAlphaPu	3.28E-5	uCi/mL	7.55E-6	Rep1 (S006 #3): no flags
Cs-137	5.50E-3	uCi/mL	5.70E-5	Rep1 (SOO6 #3): no flags
TDS	<0.2626	%		Rep1 (S006 #3): no flags

Approved By

Susan R. Jaque — **Name**

2/22/99 1525 — **Date & Time**

Report Date: *22-Feb-99*

Login Date: 15-Feb-99 **VAST Sample ID:** 99-0372

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #3
Collected:	2/14/99 1430		

Analysis	Result	Uncertainty	Lab Use Only

NOTES: (Contact the A&PC Supervisor if you have questions.)

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer repo

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Susan E. Tingey
Name

2/22/99 1525
Date & Time

A&PC Report of Analysis

Report Recipients: HLW S/S

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package page 1 of 19

Login Date: *24-Feb-99* ***VAST Sample ID:*** *99-0454*

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #4
Collected:	2/24/99 0400		

Analysis	Result		Uncertainty	Lab Use Only
Density	0.9992 (23.0 °C)	g/mL		Rep1 (S-006 #4): U1
U	<1.00E+0	ug/mL		Rep1 (M1): no flags
pH	7.18 (23 °C)	su	0.05	Rep1 (S006 #4): no flags
GrossAlpha	1.11E-4	uCi/mL	3.52E-5	Rep1 (S-006 #4): no flags
GrossBeta	3.99E-1	uCi/mL	1.48E-3	Rep1 (S-006 #4): no flags
Pu-238	Rejected	uCi/mL	Rejected	Rep1 (S-006#4): A3
Pu-238	2.35E-5	uCi/mL	7.32E-6	Rep2 (Q2704A0001): no flags
Pu-239+240	Rejected	uCi/mL	Rejected	Rep1 (S-006#4): A3
Pu-239+240	7.39E-6	uCi/mL	2.74E-6	Rep2 (Q2704A0001): no flags
TotAlphaPu	Rejected	uCi/mL	Rejected	Rep1 (S-006#4): A3
TotAlphaPu	3.09E-5	uCi/mL	1.01E-5	Rep2 (Q2704A0001): no flags
Cs-137	3.66E-1	uCi/mL	2.70E-3	Rep1 (S-006 #4): no flags

Approved By

Jacqueline D. Hill — **Name**

3/4/99 0815 — **Date & Time**

Report Date: *04-Mar-99*

Login Date: 24-Feb-99 **VAST Sample ID:** 99-0454

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #4
Collected:	2/24/99 0400		

Analysis	Result	Uncertainty	Lab Use Only
TDS	Rejected %		Rep1 (S-006 #4): A3 U1
TDS	<0.2046 %		Rep2 (S006 #4): no flags

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer repo

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Jacqueline D. Hill — **Name**

3/4/99 0815 — **Date & Time**

A&PC Report of Analysis

Report Recipients: STS

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Login Date: *09-Mar-99* ***VAST Sample ID:*** *99-0558*

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	3/9/99 1500

Department	HLWO (WTF)
Customer's ID:	S-006#6

Analysis	Result		Uncertainty	Lab Use Only
Density	0.9973 (24.0 °C)	g/mL		Rep1 (S-006): U1
U	<1.00E+0	ug/mL		Rep1 (S-006 #6): no flags
pH	2.7 (24 °C)	su	0.1	Rep1 (S-006): no flags
GrossAlpha	Rejected	uCi/mL	Rejected	Rep1 (S-006 #6): A3
GrossAlpha	1.03E-3	uCi/mL	3.31E-4	Rep2 (S-006#6 Repeat): no flags
GrossBeta	Rejected	uCi/mL	Rejected	Rep1 (S-006 #6): A3
GrossBeta	3.04E+0	uCi/mL	1.29E-2	Rep2 (S-006#6 Repeat): no flags
Pu-238	4.36E-5	uCi/mL	8.60E-6	Rep1 (Q2704A0001): no flags
Pu-239+240	1.99E-5	uCi/mL	3.95E-6	Rep1 (Q2704A0001): no flags
TotAlphaPu	6.35E-5	uCi/mL	1.26E-5	Rep1 (Q2704A0001): no flags
Cs-137	4.54E-1	uCi/mL	2.70E-3	Rep1 (S-006): no flags
TDS	<0.3433	%		Rep1 (S-006): no flags

Approved By

Vincent M Barker 3/11/99
Name

3/11/99 0240
Date & Time

Login Date: 09-Mar-99 **VAST Sample ID:** 99-0558

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	3/9/99 1500

Department	HLWO (WTF)
Customer's ID:	S-006#6

Analysis	Result	Uncertainty	Lab Use Only

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer reported.

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Vincent M Becker — Name

3/4/99 0540 — Date & Time

Report Date: 11-Mar-99

A&PC Report of Analysis

Report Recipients: VOSS/VPCR

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Login Date: *17-Mar-99* ***VAST Sample ID:*** *99-0625*

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	3/17/99 1330

Department	HLWO (WTF)
Customer's ID:	S-006#7

Analysis	Result		Uncertainty	Lab Use Only
Density	0.9956 (25.0 °C)	g/mL		Rep1 (s-006 #7): U1
U	<1.00E+0	ug/mL		Rep1 (S-006 #7): no flags
pH	3.48 (25 °C)	su	0.05	Rep1 (S-006 #7): no flags
GrossAlpha	9.71E-5	uCi/mL	3.31E-5	Rep1: no flags
GrossBeta	1.17E-1	uCi/mL	7.99E-4	Rep1: no flags
Pu-238	2.57E-5	uCi/mL	8.02E-6	Rep1: no flags
Pu-239+240	8.91E-6	uCi/mL	3.11E-6	Rep1: no flags
TotAlphaPu	3.46E-5	uCi/mL	1.11E-5	Rep1: no flags
Cs-137	1.01E-1	uCi/mL	1.10E-3	Rep1 (S-006#7): no flags
TDS	<0.2293	%		Rep1 (S-006 #7): no flags

Approved By

Jacqueline D. Hill — **Name**

3/18/99 1855 — **Date & Time**

Report Date: *18-Mar-99*

Login Date: 17-Mar-99 **VAST Sample ID:** 99-0625

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006#7
Collected:	3/17/99 1330		

Analysis	Result	Uncertainty	Lab Use Only

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer reported.

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Jacqueline D. Hill — **Name**

3/18/99 1855 — **Date & Time**

VAST

Vitrification Analytical Sample Tracking

A&PC Report of Analysis

Report Recipients: S/S FAX 4795

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Login Date: *22-Mar-99* ***VAST Sample ID:*** *99-0657*

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	3/22/99 1315

Department	HLWO (WTF)
Customer's ID:	S-006 #8

Analysis	Result		Uncertainty	Lab Use Only
Density	1.001 (25.0 °C)	g/mL		Rep1 (S-006 #8): U1
U	<1.00E+0	ug/mL		Rep1 (S-006 #8): no flags
pH	4.04 (25 °C)	su	0.05	Rep1 (S-006 #8): no flags
GrossAlpha	8.66E-5	uCi/mL	3.05E-5	Rep1 (S-006#8): no flags
GrossBeta	6.35E-2	uCi/mL	5.91E-4	Rep1 (S-006#8): no flags
Pu-238	Not Detected	uCi/mL	N.C.	Rep1 (S-006#8): no flags
Pu-238	1.27E-5	uCi/mL	4.25E-6	Rep2 (repeat): no flags
Pu-239+240	Not Detected	uCi/mL	N.C.	Rep1 (S-006#8): no flags
Pu-239+240	6.30E-6	uCi/mL	1.84E-6	Rep2 (repeat): no flags
TotAlphaPu	Not Detected	uCi/mL	N.C.	Rep1 (S-006#8): no flags
TotAlphaPu	1.90E-5	uCi/mL	6.10E-6	Rep2 (repeat): no flags
Cs-137	4.72E-2	uCi/mL	5.20E-4	Rep1 (S-006 #8): no flags

Approved By

Susan E. Fiegel — Name

3/25/99 1500 — Date & Time

Report Date: *25-Mar-99*

Login Date: 22-Mar-99 **VAST Sample ID:** 99-0657

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	3/22/99 1315

Department	HLWO (WTF)
Customer's ID:	S-006 #8

Analysis	Result	Uncertainty	Lab Use Only
TDS	<0.2333 %		Rep1 (S-006#8): no flags

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer reported.

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Susan G. Tinger
Name

3/25/99 1500
Date & Time

Report Date: 25-Mar-99

Report Recipients: STS FAX X4795

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Login Date: 25-Mar-99 *VAST Sample ID: 99-0670*

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #9
Collected:	3/25/99 2130		

Analysis	Result		Uncertainty	Lab Use Only
Density	0.9994 (24.7 °C)	g/mL		Rep1 (S-006#8): U1
U	<1.00E+0	ug/mL		Rep1 (S-006 #9): no flags
pH	4.70 (25 °C)	su	0.05	Rep1 (S-006#8): no flags
GrossAlpha	8.32E-5	uCi/mL	3.08E-5	Rep1 (S-006 #9): no flags
GrossBeta	4.42E-2	uCi/mL	4.92E-4	Rep1 (S-006 #9): no flags
Pu-238	1.27E-5	uCi/mL	3.94E-6	Rep1 (S006 #9): no flags
Pu-239+240	5.75E-6	uCi/mL	1.65E-6	Rep1 (S006 #9): no flags
TotAlphaPu	1.84E-5	uCi/mL	5.59E-6	Rep1 (S006 #9): no flags
Cs-137	3.20E-2	uCi/mL	3.80E-4	Rep1 (S-006 #9): no flags
TDS	<0.2417	%		Rep1 (s-006#9): no flags

Approved By

Name: [signature]

Date & Time: 3-30-99 1558

Report Date: 30-Mar-99

Login Date: 25-Mar-99 **VAST Sample ID:** 99-0670

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #9
Collected:	3/25/99 2130		

Analysis	Result	Uncertainty	Lab Use Only

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

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'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

John C McCoy — 3-30-99 1558

Name **Date & Time**

Report Date: 30-Mar-99

A&PC Report of Analysis

Report Recipients: STS SS (FAX 4795)

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Login Date: *05-Apr-99* ***VAST Sample ID:*** *99-0723*

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	4/4/99 2230

Department	HLWO (WTF)
Customer's ID:	S006 #10

Analysis	Result		Uncertainty	Lab Use Only
Density	1.000 (24.0 °C)	g/mL		Rep1 (S006 #10): U1
U	<1.00E+0	ug/mL		Rep1 (S-006 #10): no flags
pH	7.19 (24 °C)	su	0.05	Rep1 (S-006 #10): no flags
GrossAlpha	1.05E-4	uCi/mL	3.25E-5	Rep1 (S-006 #10): no flags
GrossBeta	6.51E-2	uCi/mL	6.29E-4	Rep1 (S-006 #10): no flags
Pu-238	2.86E-5	uCi/mL	2.51E-6	Rep1 (Q2704A0001): no flags
Pu-239+240	1.23E-5	uCi/mL	1.17E-6	Rep1 (Q2704A0001): no flags
TotAlphaPu	4.09E-5	uCi/mL	3.67E-6	Rep1 (Q2704A0001): no flags
Cs-137	4.77E-2	uCi/mL	6.20E-4	Rep1 (S-006 #10): no flags
TDS	<0.2568	%		Rep1 (S-006 #10): no flags

Approved By

Daryl D. Boulanger — Name

4/9/99 1820 — Date & Time

Report Date: *09-Apr-99*

Login Date: 05-Apr-99 **VAST Sample ID:** 99-0723

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	4/4/99 2230

Department	HLWO (WTF)
Customer's ID:	S006 #10

Analysis	Result	Uncertainty	Lab Use Only

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer reported.

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Daryl D. Beaulaye — **Name**

4/9/99 1820 — **Date & Time**

VAST

Vitrification Analytical Sample Tracking

A&PC Report of Analysis

Report Recipients: WTF S/S

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Login Date: *14-Apr-99* ***VAST Sample ID:*** *99-0780*

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	4/14/99 1610

Department	HLWO (WTF)
Customer's ID:	

Analysis	Result		Uncertainty	Lab Use Only
Density	0.9904 (24.0 °C)	g/mL		Rep1 (S-006 #11): U1
U	<1.00E+0	ug/mL		Rep1 (S-006 #11): no flags
pH	7.41 (24 °C)	su	0.05	Rep1 (S-006 #11): no flags
GrossAlpha	5.20E-5	uCi/mL	2.28E-5	Rep1 (S-006 #11): no flags
GrossBeta	2.30E-2	uCi/mL	3.73E-4	Rep1 (S-006 #11): no flags
Pu-238	1.88E-5	uCi/mL	3.06E-6	Rep1 (Q2704A0001): no flags
Pu-239+240	9.66E-6	uCi/mL	1.44E-6	Rep1 (Q2704A0001): no flags
TotAlphaPu	2.85E-5	uCi/mL	4.50E-6	Rep1 (Q2704A0001): no flags
Cs-137	1.69E-2	uCi/mL	1.00E-4	Rep1 (S-006 #11): no flags
TDS	<0.2324	%		Rep1 (S006 #11): no flags

Approved By

[signature] 4/19/99 0835

Name **Date & Time**

Report Date: *19-Apr-99*

Login Date: 14-Apr-99 **VAST Sample ID:** 99-0780

Sample Point:	S-006
Sample Type:	IN PROCESS
Collected:	4/14/99 1610

Department	HLWO (WTF)
Customer's ID:	

Analysis	Result	Uncertainty	Lab Use Only

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer reported.

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Jason P. Jorgensen
Name

4/19/99 0835
Date & Time

A&PC Report of Analysis

Report Recipients: HLWO S/S

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Login Date: *19-Apr-99* ***VAST Sample ID:*** *99-0800*

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #12
Collected:	4/19/99 1040		

Analysis	Result		Uncertainty	Lab Use Only
Density	0.9875 (24.0 °C)	g/mL		Rep1 (S-006 #12): U1
U	<1.00E+0	ug/mL		Rep1 (S-006 #12): no flags
pH	2.1 (24 °C)	su	0.1	Rep1 (S-006 #12): no flags
GrossAlpha	7.36E-4	uCi/mL	8.61E-5	Rep1 (S006 #12): no flags
GrossBeta	4.93E-2	uCi/mL	5.46E-4	Rep1 (S006 #12): no flags
Pu-238	2.82E-4	uCi/mL	9.43E-6	Rep1 (5D15B #12): no flags
Pu-239+240	1.29E-4	uCi/mL	5.09E-6	Rep1 (5D15B #12): no flags
TotAlphaPu	4.11E-4	uCi/mL	1.45E-5	Rep1 (5D15B #12): no flags
Cs-137	2.29E-2	uCi/mL	1.20E-4	Rep1 (S-006 #12): no flags
TDS	<0.1765	%		Rep1 (S-006 #12): no flags

Approved By

Name

4/20/99 1910

Date & Time

Report Date: *20-Apr-99*

Login Date: 19-Apr-99 **VAST Sample ID:** 99-0800

Sample Point:	S-006	**Department**	HLWO (WTF)
Sample Type:	IN PROCESS	**Customer's ID:**	S-006 #12
Collected:	4/19/99 1040		

Analysis	Result	Uncertainty	Lab Use Only

NOTES: **(Contact the A&PC Supervisor if you have questions.)**

The uncertainty, if provided, pertains to the 95% confidence level on counting statistics.

xHLW - Data generated from this analysis is not approved for High Level Waste.

* Effective 4/6/98, A&PC is reporting Normality as a measure of acid strength. Molarity is no longer repo

'Lab Use Only' Flags: A0 - unknown approval error; A1 - approval not defined; A2 - approval not entered; A3 - result rejected
U0 - unknown uncertainty error; U1 - uncertainty not defined; U2 - uncertainty not entered

Approved By

Name

4/20/99 1910
Date & Time

Attachment D

High-Level Waste Operations Daily Reports for
December 1, 1999, December 22, 1999, March 1, 2001,
November 8, 2001, and August 30, 2002

High Level Waste Operations Daily Report

DATE	December 1,1999
TIME	0500

SHIFT	B1	CII
VOSS	Myers	Walker

RUN NUMBER	WVNS-IRP-002
BATCH	69, 70

HIGH LEVEL WASTE OPERATIONS DAILY SUMMARY
(Work Accomplished in the Last 24 hrs.)

Vit Operations

Melter in Idle; canister WV-376 under pour spout.

Completed PAO Test on67-T002, Module 1, ("Sat.")

Worked WR # 9902305, Clean out Cold Chem Tank 65-D-02 and 65-D-03 VAC-U MAX Hopper

Completed Various Job Cards

HLWTF Operations

STS in C-A-B Process Mode

PERSONAL SAFETY, PSR AND VITAL EQUIPMENT OUT OF COMMISSION OR NEEDING ATTENTION

Component	Date Reported	Description of Problem	Effects of Problem/Action Taken

VITRIFICATION CANISTER LOCATIONS	POSITION	LOBE	CANISTER	STATUS
TURNTABLE	1	C	WV-376	Filling
	2	B	WV-375	Full
West Discharge: 1, 2 — East Discharge	3	A	WV-374	Full
Load-In: 4, 3 — Cooling	4	D	WV-377	Empty
STORAGE RACKS	1		WV-382	Empty
	2		WV-379	Empty
7, 5, 3, 1 — N	3		WV-380	Empty
8, 6, 4, 2 — S	4		WV-378	Empty
	5			
	6		WV-372	Deconned
	7			
	8		WV-381	Empty
WELDER	N			
	S		WV-373	Welded
DECON				
TRANSFER CART	1			
(Located in EDR)	2			
3, 2 — N	3			
4, 1 — S	4			

VITRIFICATION VESSEL VOLUME STATUS					
Vessel	Level	Volume	Vessel	Level	Volume
CFMT (agitator off)	36.7"	6,533 L	NH_3 Tank (Re-order level: 250 Gal)	30.4"	392 gal
MFHT (agitator off)	66.9 "	13,015 L	Caustic Tank (Re-order level: 4")	34.7"	1,169 L
DFO (Re-order level 25%)	43 %	3,497 gal	Nitric Acid Tank (Re-order level: 25")	71.0"	5,459 L

WASTE TANK FARM VESSEL VOLUME STATUS								
WTF					LWTS			
Vessel	Level	Density	Volume	pH	Vessel	Level	Density	Volume
8D-1	232.5	1.001	564,861 gal	10.1	5D-15B	0 %	1.030	32 gal
8D-2	11.2	1.001	32,338 gal	10.1	5D-15A1	0 %	N/A	21 gal
8D-3	70 %	1.002	9,561 gal		5D-15A2	52 %	1.16	2,661 gal
8D-4	37.6 %	1.014	5,068 gal		7D-14	18 %		108 gal
					7D-2	43 %		2,596 gal

High Level Waste Operations Daily Report

DATE	December 22,1999
TIME	0500

SHIFT	AI	BII
VOSS	Curcio	Myers

RUN NUMBER	WVNS-IRP-002
BATCH	70

HIGH LEVEL WASTE OPERATIONS DAILY SUMMARY
(Work Accomplished in the Last 24 hrs.)

Vit Operations

Melter feeding ; canister WV-377 under pour spout.

Completed filling of WV-376, Rotated turntable to fill WV-377

Worked on WO#9901910, Replace vit VOG prefilter assy. 63-T-038

Completed Camera 103 installation

Supported Weekly Maint. Job Cards

Replaced LWOA Filters 67-F-021

Supported LIF to EDR transfer of equipment

HLWTF Operations

STS in Recirc

LWTS Processing

PERSONAL SAFETY, PSR AND VITAL EQUIPMENT OUT OF COMMISSION OR NEEDING ATTENTION

Component	Date Reported	Description of Problem	Effects of Problem/Action Taken

VITRIFICATION CANISTER LOCATIONS	POSITION	LOBE	CANISTER	STATUS
TURNTABLE West Discharge: 1, 2 :East Discharge Load-In: 4, 3 :Cooling	1	D	WV-377	Filling
	2	C	WV-376	Full
	3	B	WV-375	Full
	4	A	WV-374	Full
STORAGE RACKS 7, 5, 3, 1 N 8, 6, 4, 2 S	1		WV-382	Empty
	2		WV-379	Empty
	3		WV-380	Empty
	4		WV-378	Empty
	5			
	6		WV-372	Deconned
	7			
	8		WV-381	Empty
WELDER	N			
	S		WV-373	Welded
DECON				
TRANSFER CART (Located in EDR) 3, 2 N 4, 1 S	1			
	2			
	3			
	4			

VITRIFICATION VESSEL VOLUME STATUS					
Vessel	Level	Volume	Vessel	Level	Volume
CFMT (agitator off)	56.2	10,126 L	NH_3 Tank (Re-order level: 250 Gal)	27.1"	360.8 gal
MFHT (agitator off)	86.0 "	16,371 L	Caustic Tank (Re-order level: 4")	28.1"	982 L
DFO (Re-order level 25%)	60 %	4463 gal	Nitric Acid Tank (Re-order level: 25")	23.2"	2,357 L

WASTE TANK FARM VESSEL VOLUME STATUS								
WTF					LWTS			
Vessel	Level	Density	Volume	pH	Vessel	Level	Density	Volume
8D-1	212.4	1.014	509,643 gal	10.1	5D-15B	13 %	1.04	1,172 gal
8D-2	12.2	1.012	34,742 gal	10.3	5D-15A1	8 %	1.01	374 gal
8D-3	19.3	1.005	2,595 gal		5D-15A2	62 %	1.18	3,303 gal
8D-4	39.1	1.012	5,277 gal		7D-14	57 %		296 gal
					7D-2	44 %		2,684 gal

High Level Waste Operations Daily Report

			VIT		WTF	
DATE	Mar 1, 2001	SHIFT	C I	D II	D I	B II
TIME	0500	VOSS	Walker	Slomba	Dunn	Myers

RUN NUMBER	WVNS-IRP-002
BATCH	72, 73

HIGH LEVEL WASTE OPERATIONS DAILY SUMMARY
(Work accomplished in the last 24 hours)

Vitrification Operations

Melter in idle, canister WV-392 under pour spout.

Continued troubleshooting MFHT agitator 63-K-011

Performed Monthly job cards and Housekeeping.

HLWTF Operations

Took 8D-2 samples #2, #3, and #4 with burnishing tool

Sampled mercury columns off vent lines

Operators continued qualification studies

PERSONAL SAFETY, PSR AND VITAL EQUIPMENT OUT OF COMMISSION OR NEEDING ATTENTION

Component	Date Reported	Description of Problem	Effects of Problem/Action Taken

VITRIFICATION CANISTER LOCATIONS	POSITION	LOBE	CANISTER	STATUS
TURNTABLE West Discharge | 1 | 2 | East Discharge Load-In | 4 | 3 | Cooling	1	D	WV-392	Filling
	2	C	WV-391	Full
	3	B	WV-390	Full
	4	A	WV-393	Empty
STORAGE RACKS 7 | 5 | 3 | 1 | N 8 | 6 | 4 | 2 | S	1			
	2			
	3			
	4			
	5			
	6			
	7		WV-394	Empty
	8			
WELDER	N			
	S			
DECON				
TRANSFER CART (Located in EDR) 3 | 2 | N 4 | 1 | S	1			
	2			
	3			
	4			

VITRIFICATION VESSEL VOLUME STATUS					
Vessel	Level	Volume	Vessel	Level	Volume
CFMT (agitator off)	62.7"	11,323.8 L	NH_3 Tank (Re-order level: 250 Gal)	30.1"	388 gal
MFHT (agitator off)	88.8"	16,878.7 L	Caustic Tank (Re-order level: 4")	27.9"	977 L
DFO (Re-order level 25%)	44%	3,554 gal	Nitric Acid Tank (Re-order level: 25")	83.7"	6300 L

WASTE TANK FARM VESSEL VOLUME STATUS								
WTF					LWTS			
Vessel	Level	Density	Volume	pH	Vessel	Level	Density	Volume
8D-1	205"	1.0	499,075 gal	10.0	5D-15B	46 %	1.0	6,800 gal
8D-2	40"	1.0	101,374 gal	10.0	5D-15A1	0 %	1.0	21 gal
8D-3	22.9 %	1.0	3,141 gal		5D-15A2	12 %	1.18	307 gal
8D-4	65.1 %	1.0	8,878 gal		7D-14	47 %		248 gal
					7D-2	43 %		2,596

High Level Waste Operations Daily Report

DATE	Nov 8,2001
TIME	0500

	VIT		WTF	
SHIFT	CI	DII	DI	BII
VOSS	Walker	Morgan	Dunn	Myers

RUN NUMBER	WVNS-IRP-002
BATCH	74, 75

HIGH LEVEL WASTE OPERATIONS DAILY SUMMARY
(Work accomplished in the last 24 hours)

VITRIFICATION OPERATIONS

Melter Idling, canister WV-399 under pour spout.

Continued with CFMT agitator fixture mock-ups and testing.

Completed CMR camera repairs.

Supported I/Cwith HVAC transmittersreplacement.

Worked job cards and houskeeping.

Returned Crane to service incell

HLWTF OPERATIONS

Completed equipment and hose removal from 8D-2 M-4 riser

Placed LWTS Evaporator on line

Sampled rad monitors and mercury columns

PERSONAL SAFETY, PSR AND VITAL EQUIPMENT OUT OF COMMISSION OR NEEDING ATTENTION

Component	Date Reported	Description of Problem	Effects of Problem/Action Taken

VITRIFICATION CANISTER LOCATIONS	POSITION	LOBE	CANISTER	STATUS
TURNTABLE	1	C	WV-399	Filling
	2	B	WV-398	Full
West Discharge: 1, 2 — East Discharge	3	A	WV-397	Full
Load-In: 4, 3 — Cooling	4	D	WV-400	Empty
STORAGE RACKS	1			
	2			
7, 5, 3, 1 — N	3			
8, 6, 4, 2 — S	4			
	5			
	6			
	7			
	8			
WELDER	N			
	S			
DECON				
TRANSFER CART	1			
In EDR	2			
3, 2 — N	3			
4, 1 — S	4			

VITRIFICATION VESSEL VOLUME STATUS					
Vessel	Level	Volume	Vessel	Level	Volume
CFMT (agitator on)	29.2 "	5,132.5 L	NH_3 Tank (Re-order level: 250 Gal)	32"	562 gal
MFHT (agitator off)	57.9 "	11,273 L	Caustic Tank (Re-order level: 4")	28.0"	979 L
DFO (Re-order level 25%)	31%	2,815 gal	Nitric Acid Tank (Re-order level: 25")	.6"	923 L

WASTE TANK FARM VESSEL VOLUME STATUS								
WTF					LWTS			
Vessel	Level	Density	Volume	pH	Vessel	Level	Density	Volume
8D-1	74.2"	1.0	185,528 gal	10.2	5D-15B	37%	1.0	5,102 gal
8D-2	13.8"	1.0	38,569 gal	10.2	5D-15A1	0%	1.0	21 gal
8D-3	12.4%	1.0	1,694 gal		5D-15A2	15%	1.19	407 gal
8D-4	50.9%	1.0	6,952 gal		7D-14	40%		214 gal
					7D-2	16%		174 gal

High Level Waste Operations Daily Report

DATE	Aug. 30, 2002
TIME	0500

	VIT			WTF	
SHIFT	I	II	III	B-I	D-II
VOSS	Walker	Myers	Montgmery	Myers	Watson

RUN NUMBER	WVNS-IRP-002
BATCH	77

HIGH LEVEL WASTE OPERATIONS DAILY SUMMARY (Work accomplished in the last 24 hours)
VITRIFICATION OPERATIONS
Melter in idle, preps being made for Evacuated Canister deployment and Melter shutdown on or about Sept 5th.
Supported D&D with oil removal, sled staged for mods.
Flushed incell offgas heme's to SBS, switched incell off gas trains.
Washed and smeared jumper H-11-7769 and E tree pedestal, placed on transfer cart
Loosen nuts on 4 pack
Completed HLW operations cross training.
Send shard sampler into Vit Cell
HLWTF OPERATIONS
Completed HLW cross training of personnel
Completed setup of 12' platform at test tower
Supported Maint-E and Vendor with 50-P-01 pm's
Supported Maint-E and Maint-M with pm work on 50-K-002
Locked out 50-K-001 for upcoming pressure switch adjustment work

PERSONAL SAFETY, PSR AND VITAL EQUIPMENT OUT OF COMMISSION OR NEEDING ATTENTION			
Component	**Date Reported**	**Description of Problem**	**Effects of Problem/Action Taken**

VITRIFICATION CANISTER LOCATIONS	POSITION			
TURNTABLE West Discharge: 1, 2 — East Discharge Load-In: 4, 3 — Cooling	1	A	WV-410	Full
	2	D	WV-413	Empty
	3	C	WV-412	Full
	4	B	WV-411	Full
STORAGE RACKS 7, 5, 3, 1 — N 8, 6, 4, 2 — S	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
WELDER	N			
	S			
DECON			WV-409	Deconned
TRANSFER CART In EDR 3, 2 — N 4, 1 — S	1			
	2			
	3			
	4			

VITRIFICATION VESSEL VOLUME STATUS					
Vessel	Level	Volume	Vessel	Level	Volume
CFMT (agitator off)	56.5"	10,181 L	NH_3 Tank (Re-order level: 250 Gal)	52.5"	594 gal
MFHT (agitator Off)	0 "	593 L	Caustic Tank (Re-order level: 4")	22.9"	835.2 L
DFO (Re-order level 25%)	28%	2,645gal	Nitric Acid Tank (Re-order level: 25")	17.8"	2,012 L

WASTE TANK FARM VESSEL VOLUME STATUS								
WTF					LWTS			
Vessel	Level	Density	Volume	pH	Vessel	Level	Density	Volume
8D-1	48.5 "	1.0	123,963 gal	10.2	5D-15B	2 %	1.0	99 gal
8D-2	1.1 "	1.0	8,137 gal	10.2	5D-15A1	0 %	1.0	21 gal
8D-3	19.8 %	1.0	2,704 gal		5D-15A2	53 %	1.2	2,729 gal
8D-4	13.8 %	1.0	1,885 gal		7D-2	38 %		2,006 gal
					7D-13	4 %		41 gal
					7D-14	63 %		326 gal

Attachment E

Radionuclide Inventory Calculations

Exhibit 1: Typical Tank 8D-3 Inventory Calculation for Tc-99, Np-237, Pu-238, Pu-239/240, Am-241, Cm-243/244, and Sr-90

Example Radionuclide: Tc-99

Analysis: VAST Report 01-0349

Sample Location: Tank 8D-1 Unmobilized Liquid

Sample Date: 3/1/01

SBWW Volume: 600,449 gallons (from 3/1/01 HLW Operations Daily Report, Attachment D; Total of Tank 8D-1 and 8D-2)

Sample Density: 1.01 g/ml (average of 6 replicate samples)

Tc-99 Sample Result: 5.61e-03 uCi/g (average of 6 replicate samples)

Tc-99 Sample Concentration, uCi/ml	=	(Tc-99 Sample Result, uCi/g) x (Sample Density, g/ml)
	=	(5.61e-03 uCi/g) x (1.01 g/ml)
	=	5.66e-03 uCi/ml
Tc-99 SBWW Sampled Inventory, Ci	=	(Tc-99 Sample Concentration, uCi/ml) x (3785 ml/gal) x (SBWW Volume, gal) x (1 Ci/1,000,000 uCi)
	=	(5.66e-03 uCi/ml) x (3785 ml/gal) x (600,449 gallons) x (1 Ci/1,000,000 uCi)
	=	1.29e+01 Ci Tc-99

Since it is conservatively assumed that the Tc-99 SBWW Tank Farm inventory does not change as a result of STS processing, the Tc-99 concentration in the current (August 30, 2002) SBWW volume can be calculated as shown below.

SBWW volume from August 30, 2002 HLW Operations Daily Report in Attachment D is calculated:

SBWW volume as of 8/30/02, gal	=	(Tank 8D-1 Volume, gal) + (Tank 8D-2 Volume, gal)
	=	(123,963 gal) + (8,137 gal)
	=	132,100 gal
Tc-99 SBWW concentration uCi/ml	=	(Tc-99 SBWW Sampled Inventory, Ci) x (1 gal/3785 ml) x (SBWW Volume as of 8/30/02, gal) x (1,000,000 uCi/Ci)
	=	(1.29e+01 Ci) x (1 gal/3785 ml) x (1/132,100 gal) x (1,000,000 uCi/Ci)
	=	2.57e-02 uCi/ml

Since it is conservatively assumed that Tc-99 is not removed by STS processing, the Tank 8D-3 decontaminated SBWW heel of 1800 gallons will be at the same Tc-99 concentration as calculated above.

The Tank 8D-3 Tc-99 inventory is calculated as follows:

Tc-99 Tank 8D-3 inventory as of 3/1/01, Ci = (Tc-99 SBWW Concentration, uCi/ml) x (1 Ci/1,000,000 uCi)(3785 ml/gal) x (Tank 8D-3 Heel Volume, gal)
= (2.57e-02 uCi/ml) x (1 Ci/1,000,000 uCi) x (3785 ml/gal) x (1800 gal)
= 1.75e-01 Ci Tc-99

Exhibit 2: Tank 8D-3 Inventory Calculation for Cs-137

Continued STS processing has resulted in significant Cs-137 reduction in the Tank Farm SBWW since the March 1, 2001 sample date. A more recent sample of the SBWW will be used to calculate the Cs-137 inventory of Tank 8D-3.

Analysis: VAST Report 01-2357

Sample Location: Tank 8D-1 Unmobilized Liquid

Sample Date: 11/8/01

SBWW Volume: 224,097 gallons (from 11/8/01 HLW Operations Daily Report, Attachment D)

Cs-137 Sample Result: 1.42e+01 uCi/ml

This November 2001 sample result is a conservative estimate of the Cs-137 concentration in the current August 30, 2002 SBWW volume of 132,100 gallons, as subsequent STS processing results in a reduction of both the SBWW volume and Cs-137 curie inventory.

Based on historical STS processing data shown below in Figure1 which was obtained from Reference 7, the STS processing can conservatively achieve a decontamination factor of Cs-137 of 10^3.

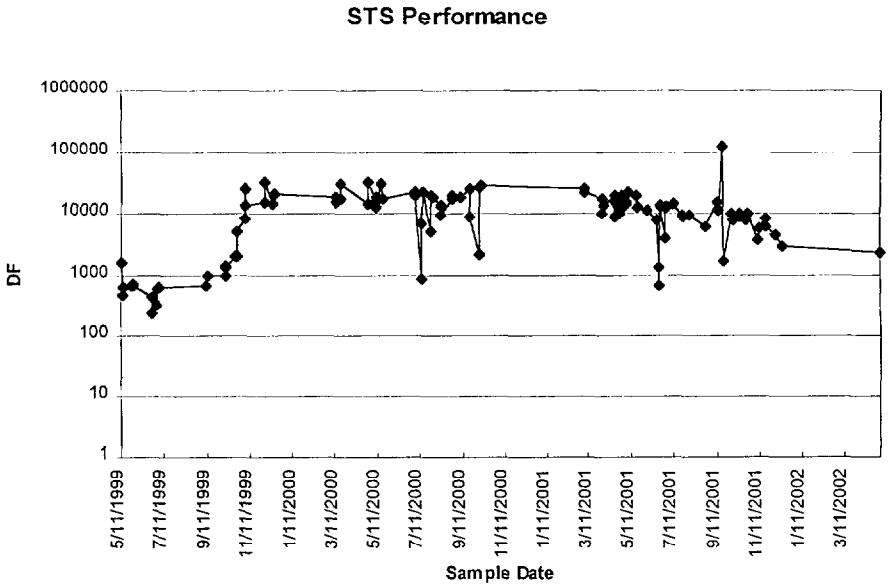

Figure 1

Applying this decontamination factor to the SBWW Cs-137 concentration, results in a 10^3 reduction of the Cs-137 concentration in the Tank 8D-3 decontaminated SBWW as shown below.

Tank 8D-3 decontaminated SBWW Cs-137 concentration = (Cs-137 SBWW Concentration uCi/ml) / (STS DF)
= (1.42e+01 uCi/ml) / (10^3)
= 1.42e-02 uCi/ml

The Tank 8D-3 Cs-137 inventory is then calculated as follows:

Cs-137 Tank 8D-3 inventory as of 11/8/01, Ci = (Tank 8D-3 Decontaminated SBWW Cs-137 Concentration, uCi/ml) x (1 Ci/1,000,000 uCi) x (3785 ml/gal) x (Tank 8D-3 Heel Volume, gal)
= (1.42e-02 uCi/ml) x (1 Ci/1,000,000 uCi) x (3785 ml/gal) x (1800 gal)
= 9.67e-02 Ci Cs-137

Exhibit 3: Tank 8D-3 Inventory Calculation for the Unmeasured Radionuclides C-14, I-129, and Pu-241

For radionuclides not directly measured in VAST Report 01-0349, the Pacific Northwest National Laboratory (PNNL) Batch 10 isotopic distributions will be used[11,12]. This will apply to C-14, I-129, and Pu-241 and is consistent with the methodology outlined in the Tank 8D-1 liquid waste inventory reporting as described in the High-Level Waste Tanks 8D-1 and 8D-2 Radionuclide Inventory Report as of July 31, 2001 [13]. See Table 1 for the isotopic scaling factors.

TABLE 1: Isotopic Scaling Factors

Project Isotopes	Scaling Radionuclide	Batch 10 Ratio	Batch 10 Ratio Decayed from May 1997 to March 2001
C-14	Tc-99	5.80e-03	5.80e-03
I-129	Tc-99	4.62e-06	4.62e-06
Pu-241	Pu-238	8.68e+00	7.71e+00

To calculate the C-14 Tank 8D-3 inventory:

C-14 8D-3 inventory decayed to 3/1/01, Ci = (Tc-99 Tank 8D-3 Inventory decayed to 3/1/01, Ci) x (Batch 10 Ratio Decayed from May 1997 to March 2001)
= (1.75e-01 Ci Tc-99)(5.80e-03)
= 1.02e-03 Ci C-14

Exhibit 4: Tank 8D-3 Inventory Calculation for the Uranium Isotopes

Samples of the STS effluent (Vast ID 99-2205) and the LWTS concentrates (Vast ID 99-2385) were collected on December 1 and 22 , 1999, respectively. These sample analyses are used here to calculate the uranium isotopic concentration in the SBWW as explained below.

Example Radionuclide: U-232

Analysis: VAST Report 01-2385

Sample Location: LWTS Concentrate (5D-15A1)

Sample Date: 12/22/99

U-232 Sample Result: 5.86e-03 uCi/ml

Total U Sample Result: 4.55e+02 ug/ml (average of two replicate sample results)

Additionally, the STS effluent total uranium sample analysis is used to determine the U-232 concentration of the decontaminated SBWW as shown below.

Analysis: VAST Report 01-2205

Sample Location: Decontaminated SBWW, STS Effluent

Sample Date: 12/01/99

Total U Sample Result: 6.05e+01 ug/ml (average of two replicate sample results)

SBWW Volume: 597,199 gallons (from 12/1/99 HLW Operations Daily Report, Attachment D)

U-232 concentration of the decontaminated SBWW ug/ml = (U-232 LWTS Concentrate, uCi/ml) x (Total uranium in decontaminated SBWW, ug/ml / Total uranium in LWTS Concentrate, ug/ml)

= (5.86e-03 uCi/ml) x (6.05e+01 / 4.55e+02 ug/ml)

= 7.79e-04 ug/ml

U-232 SBWW sampled inventory, Ci = (U-232 Concentration of the decontaminated SBWW, ug/ml) x (3785 ml/gal) x (SBWW Volume as of 12/1/99, gal) x (1 Ci / 1,000,000 uCi)

= (7.79e-04 ug/ml) x (3785 ml/gal) x (597,199 gal) x (1 Ci / 1,000,000 uCi)

= 1.76e-00 Ci U-232

Since it is conservatively assumed that the U-232 SBWW Tank Farm inventory does not change as a result of STS processing, the U-232 concentration in the current (August 30, 2002) SBWW volume can be calculated as shown below:

SBWW volume from the August 30, 2002 HLW Operations Daily Report in Attachment D is calculated:

SBWW volume as of 8/30/02, gal	=	(Tank 8D-1 Volume, gal) + (Tank 8D-2 Volume, gal)
	=	(123,963 gal) + (8,137 gal)
	=	132,100 gal
U-232 SBWW concentration, uCi/ml	=	(U-232 SBWW Sampled Inventory, Ci) x (1 gal/3785 ml) (SBWW Volume as of 8/30/02, gal) x (1,000,000 uCi/Ci)
	=	(1.76e-00 Ci) x (1 gal/3785 ml) x (1/132,100 gal) x (1,000,000 uCi/Ci)
	=	3.53e-03 uCi/ml

Since it is conservatively assumed that U-232 is not removed by STS processing, the Tank 8D-3 decontaminated SBWW heel of 1800 gallons will be at the same U-232 concentration as calculated above.

The 8D-3 U-232 inventory is calculated as follows:

U-232 8D-3 inventory as of 12/1/99, Ci	=	(U-232 SBWW Concentration, uCi/ml) x (1 Ci/1,000,000 uCi) x (3785 ml/gal) x (Tank 8D-3 Heel Volume, gal)
	=	(3.53e-03 uCi/ml) x (1 Ci/1,000,000 uCi) x (3785 ml/gal) x (1800 gal)
	=	2.40e-02 Ci U-232

Prepared by: _____ Date: 9/20/02

Peer Reviewed by: _____ Date: 9/20/02

Attachment F

MicroShield™ Decay/Ingrowth Calculations

MicroShield v5.03 (5.03-00241)
West Valley Demonstration Project

Page : 1
DOS File: Case1
Run Date: September 13, 2002
Run Time: 11:08:55 AM
Duration: 00:00:00

File Ref:
Date: 9/13/02
By: EL
Checked: MF For PW 9/20/02

Case Title: Case 1
Description: Case 1
Geometry: 1 - Point

Dose Points

	X	Y	Z
# 1	10 cm	0 cm	0 cm
	3.9 in	0.0 in	0.0 in

Shields

Shield Name	Material	Density
Air Gap	Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels
Ac-225	3.4065e-006	1.2604e+005
Ac-227	6.3048e-012	2.3328e-001
Ac-228	1.5119e-016	5.5940e-006
Am-241	1.9595e-003	7.2503e+007
Am-243	6.1765e-012	2.2853e-001
At-217	3.4065e-006	1.2604e+005
Ba-137m	8.4283e-002	3.1185e+009
Bi-210	4.3449e-012	1.6076e-001
Bi-211	5.9061e-012	2.1852e-001
Bi-212	1.6868e-002	6.2413e+008
Bi-213	3.4064e-006	1.2604e+005
Bi-214	1.2258e-010	4.5355e+000
C-14	1.0166e-003	3.7613e+007
Cm-243	7.3185e-006	2.7078e+005
Cm-244	1.8169e-004	6.7225e+006
Cs-137	8.9094e-002	3.2965e+009
Fr-221	3.4065e-006	1.2604e+005
Fr-223	8.7004e-014	3.2191e-003
I-129	8.1040e-007	2.9985e+004
Np-237	5.4480e-004	2.0158e+007
Np-239	6.1611e-012	2.2796e-001
Pa-231	1.1489e-010	4.2510e+000
Pa-233	5.4480e-004	2.0158e+007
Pa-234	3.8448e-007	1.4226e+004
Pa-234m	2.4030e-004	8.8911e+006
Pb-209	3.4058e-006	1.2602e+005
Pb-210	4.4169e-012	1.6343e-001
Pb-211	5.9061e-012	2.1853e-001
Pb-212	1.6869e-002	6.2414e+008
Pb-214	1.2259e-010	4.5357e+000
Po-210	2.8684e-012	1.0613e-001

Nuclide	curies	becquerels
Po-211	1.6124e-014	5.9657e-004
Po-212	1.0808e-002	3.9988e+008
Po-213	3.3328e-006	1.2331e+005
Po-214	1.2256e-010	4.5346e+000
Po-215	5.9064e-012	2.1854e-001
Po-216	1.6872e-002	6.2428e+008
Po-218	1.2262e-010	4.5368e+000
Pu-238	2.7588e-003	1.0208e+008
Pu-239	5.2495e-004	1.9423e+007
Pu-240	4.0082e-004	1.4830e+007
Pu-241	1.8413e-002	6.8129e+008
Ra-223	5.9064e-012	2.1854e-001
Ra-224	1.6872e-002	6.2428e+008
Ra-225	3.4451e-006	1.2747e+005
Ra-226	1.2365e-010	4.5752e+000
Ra-228	1.5127e-016	5.5969e-006
Rn-219	5.9064e-012	2.1854e-001
Rn-220	1.6872e-002	6.2428e+008
Rn-222	1.2262e-010	4.5368e+000
Sr-90	1.5081e+001	5.5801e+011
Tc-99	1.7540e-001	6.4897e+009
Th-227	5.9707e-012	2.2092e-001
Th-228	1.6904e-002	6.2545e+008
Th-229	3.5022e-006	1.2958e+005
Th-230	1.5937e-007	5.8966e+003
Th-231	1.5170e-006	5.6129e+004
Th-232	8.0465e-016	2.9772e-005
Th-234	2.4030e-004	8.8911e+006
Tl-207	5.8899e-012	2.1793e-001
Tl-208	6.0608e-003	2.2425e+008
Tl-209	7.3577e-008	2.7224e+003
U-232	2.2935e-002	8.4859e+008
U-233	1.0350e-002	3.8294e+008
U-234	4.9400e-003	1.8278e+008
U-235	1.5170e-006	5.6129e+004
U-236	4.5510e-006	1.6839e+005
U-237	4.5170e-007	1.6713e+004
U-238	2.4030e-004	8.8911e+006
Y-90	1.5085e+001	5.5816e+011

Buildup
The material reference is : Air Gap

Results

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	3.303e+02	3.870e-03	3.886e-03	3.319e-04	3.333e-04
0.02	1.534e-02	2.421e-07	2.431e-07	8.386e-09	8.421e-09
0.03	1.883e+08	4.479e+03	4.499e+03	4.439e+01	4.459e+01
0.04	4.977e+07	1.580e+03	1.587e+03	6.987e+00	7.018e+00

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.05	2.517e+05	9.990e+00	1.003e+01	2.661e-02	2.673e-02
0.06	2.836e+07	1.351e+03	1.357e+03	2.683e+00	2.694e+00
0.08	2.594e+08	1.648e+04	1.654e+04	2.608e+01	2.618e+01
0.1	1.470e+07	1.168e+03	1.171e+03	1.786e+00	1.792e+00
0.15	2.482e+06	2.958e+02	2.966e+02	4.872e-01	4.884e-01
0.2	3.064e+08	4.869e+04	4.878e+04	8.594e+01	8.610e+01
0.3	5.120e+07	1.221e+04	1.222e+04	2.315e+01	2.319e+01
0.4	1.335e+06	4.243e+02	4.248e+02	8.267e-01	8.277e-01
0.5	5.122e+07	2.036e+04	2.038e+04	3.996e+01	4.000e+01
0.6	2.995e+09	1.429e+06	1.430e+06	2.788e+03	2.791e+03
0.8	1.231e+08	7.829e+04	7.835e+04	1.489e+02	1.490e+02
1.0	9.721e+06	7.730e+03	7.734e+03	1.425e+01	1.426e+01
1.5	2.140e+07	2.552e+04	2.553e+04	4.294e+01	4.296e+01
2.0	1.237e+06	1.968e+03	1.969e+03	3.044e+00	3.045e+00
3.0	2.238e+08	5.340e+05	5.342e+05	7.245e+02	7.247e+02
TOTALS:	4.328e+09	2.183e+06	2.185e+06	3.954e+03	3.958e+03

Prepared by: Ed Lafferty / E. Lachapelle 9/16/02

Peer Review By: Paul Winkler 9/16/2002
PAUL WINKLER

Attachment G

Technical Review and Approval Panel Consensus Statement

FACILITY CHARACTERIZATION PROJECT

Technical Review and Approval Panel
Consensus Statement

Unit Name(s): Waste Storage Tank 8D-3

Summary of Technical Approach that was utilized (attach additional sheets if required):

The technical approach for determining the radionuclide inventory of Tank 8D-3 will use existing results of processed and unprocessed SBWW samples and a projected future volume of waste remaining in Tank 8D-3 to calculate a bounding estimate.

The following assumptions are made in order to forecast the specific long-lived radionuclide inventory that will remain in Tank 8D-3 at the completion of SBWW processing in FY2003. Several of these assumptions are based on management decisions and the current plans for future operations:

- Once Vitrification is complete in FY2002, Tank 8D-3 will be used solely for the receipt of decontaminated SBWW liquids processed through the STS. It is very unlikely that any other material could be routed to this tank.
- At the completion of STS processing, a heel of 1,800 gallons of decontaminated SBWW will remain in Tank 8D-3 based on typical heel volumes left by the transfer pump.
- The pH of the SBWW will not be adjusted resulting in an increase or decrease in the present solubility of uranium in the SBWW. Some thought had been given to a pH adjustment, however, current plans do not call for this step.
- A decontamination factor of 10^3 for cesium is achieved by STS processing based on typical minimal decontamination factors demonstrated by the process[7].

Prior sample analyses of processed and unprocessed SBWW contained in Tank 8D-1 will be used to directly calculate a radionuclide inventory of the residual liquid heel which will remain in Tank 8D-3 following completion of SBWW STS processing in FY2003.

No significant amount of insoluble solids are expected to have accumulated in Tank 8D-3 since only CFMT distillates and filtered STS liquids were transferred into Tank 8D-3. The solutions processed through the STS are filtered through a sintered metal prefilter. The decontaminated STS solutions are processed through a sand bed type postfilter to remove zeolite fines that could recontaminate the process.

With the STS having processed over one million gallons of SBWW through Tank 8D-3 since 1995, it is reasonable to conclude that the contribution of HLW pretreatment liquids (pre-1995) to the Tank 8D-3 source term is trivial. In addition, the radionuclide composition of the CFMT overheads are consistent with the composition of decontaminated SBWW from STS processing with the exception of cesium as seen in Table 2.

Additionally, the Tank 8D-3 inventory due to corrosion/adsorption has been estimated to be less than one curie of predominantly Sr-90 as reported in WVDP-EIS-017[3]. As explained in WVDP-EIS-017, the major cause of Tank 8D-3 surface contamination is the deposition of an oxide corrosion film. Incorporation of radionuclides on the surface of the vessel (in the oxide film) and deposition of radioactive particles on the outer surface of the oxide film results in an insignificant contribution to the Tank 8D-3 inventory reported in Table 7.

In addition to the residual radionuclides inventory of the tank liquid heel, a number of possible processes such as corrosion, plating, precipitation, and adsorption which resulted in tank surface contamination have also been considered in evaluating the Tank 8D-3 radionuclide inventory. As discussed in WVDP-EIS-017, incorporation of radionuclides on the surface of the vessel (in the oxide film) and deposition of radioactive particles on the outer surface of the oxide film results in an insignificantly higher Tank 8D-3 inventory.

Conservatively Bounded Curie Estimate:

Projected Tank 8D-3 Radionuclide Inventory

Project Isotopes	Curies
C-14	1e-03
Tc-99	2e-01
I-129	8e-07
U-232	2e-02
U-233	1e-02
U-234	5e-03
U-235	2e-06
U-236	5e-06
Np-237	5e-04
U-238	2e-04
Pu-238	3e-03
Pu-239	5e-04
Pu-240	4e-04
Pu-241	2e-02
Am-241	2e-03
Cm-243	8e-06
Cm-244	2e-04
Cs-137	1e-01
Sr-90	2e+01

Using best engineering judgement and available information, the following listed Technical Review and Approval Panel Members have reviewed the technical approach and resultant conservative curie estimate for the stated area/cell and have reached consensus that the approach and resultant estimate are technically sound for purposes of this project's scope as identified in the Characterization Management Plan for the Facility Characterization Project (WVDP-403).

Senior Project Manager:	J. Mahoney	9/23/02 (Signature/Date)
Project Manager:	L. Rowell	9/23/02 (Signature/Date)
Project Lead:	J. Fazio	9/23/02 (Signature/Date)
Radiation Engineering and Safety:	P. Winkler	9-23-2002 (Signature/Date)
Radiation Protection:	D. Tharnish	9/23/02 (Signature/Date)
Regulatory Programs:	D. Westcott	9/23/02 (Signature/Date)
Analytical and Process Chemistry:	C. Maddigan	9/23/02 (Signature/Date)

WVNS RECORD OF REVISION

Rev. No.	Description of Changes	Revision On Page(s)	Dated
0	Original Issue Facility Characterization Project, Regulatory Programs Departments are affected by this document.	All	09/24/02